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Photo by J. W. Chamberlain

A waterspout observed off Cottage City (now Oak Bluff), Martha's Vineyard, in 1896. The collar of water around the base of the spout was 420 feet in height

Waterspouts I Have Not Met

By CHARLES FITZHUGH TALMAN

Author of "The Realm of the Air," "Our Weather," etc.

MANY years ago there was a British meteorologist named Ralph Abercromby who longed to encounter a tropical cyclone. He visited Mauritius at the height of the hurricane season, and he sailed all through the China seas, where such storms, there denominated typhoons, are notoriously rife, but everywhere the weather remained perversely serene. So he returned, safe and disconsolate, to London.

Nowadays one could hardly be so unfortunate. Almost every hurricane that occurs on the ocean is discovered early in its career and charted from point to point along its course with the aid of radio reports. Therefore, with a swift ship or a swifter aeroplane at his disposal, the hurricane-hunter would probably not have much difficulty in getting to a place toward which one of these storms was headed in ample time to be shipwrecked or planewrecked, as the case might be, when it came along.

Not so with waterspouts. These picturesque denizens of the deep are still as elusive as ever, and finding one is merely a matter of luck. Throughout the world hundreds of them are formed and dissipated every year, but compared with a tropical cyclone each is of insignificant size, and while a cyclone travels for days or even weeks before it dies out, the life of the average waterspout is only about fifteen minutes.

Thus there are probably a good many old salts — to say nothing of mere meteorologists — who have never seen a waterspout. Not only is the sight of one a rare experience in the life of the average sailor, but it has not even become commonplace in Oshkosh and Tuscaloosa, where the public has grown so tired of seeing African natives chewed up by lions. There is, I believe, only one motion picture film of a waterspout extant. It was taken from a seaplane in the West Indies by Captain A. W. Stevens during a recent flight to South America under the direction of the National Geographic Society.

It is elementary information that a waterspout is a cloud and not a solid column of water, but popular expositors sometimes lay too much stress on this point and convey the erroneous impression that waterspouts are always rather dry affairs. The fact is that they vary greatly in the amount of water they contain. There are pronounced "wets" as well as "drys" among them. The reason for this will appear if we consider how waterspouts are formed.

A vortex is, first of all, set up in the air. This may begin, as in the case of a tornado, far above the earth in the conflict between two streams of air flowing in different directions or at different velocities, especially where these streams differ markedly in temperature and humidity. Most vortices thus formed die in the upper atmosphere, but occasionally one is so strongly developed that it works its way down to the ground as a tornado, or to the water as a waterspout. In other cases, especially in the tropics, the vortex begins in the overheated and

overmoist air at the surface of the water and works upward.

In either case centrifugal force diminishes the pressure inside the vortex, where the air cools because of expansion and condenses some of its invisible water vapor, forming a column of cloud. This cloud is the principal visible part of the waterspout, and it is, in some spots,

U. S. Weather Bureau

Waterspouts are not confined to salt water. This spout, on Lake Erie, was within one-quarter mile of the camera. Above, a spout photographed on Lake Winnipeg

a mere filmy shell through which distant objects can be plainly seen, but at its base a large amount of spray is swept up from the surface of the water. How much of this is carried aloft and how far it rises depends in part on the violence of the whirl and in part on the state of the water — whether calm or agitated — from which it comes. More will be gathered from the waves of a stormy sea than from a relatively smooth one.

The water lifted by this process is sometimes seen to reach a height of scores or hundreds of feet, where it is flung out in a great cascade surrounding the column. In the case of the famous waterspout seen off Cottage City, Massachusetts, August 19th, 1896, photographs show this cascade forming a collar around the spout at a height of 420 feet. Another fact bearing upon the wetness of waterspouts is that a spout often culminates in a cloudburst. The uprush of air in the vortex leads to rapid condensation of moisture, but also prevents the resulting water drops from falling. Presently the vortex dies out, and then the accumulated water descends in a tremendous downpour.

A few years ago the White Star liner *Pittsburgh* was struck bow-on by a waterspout in mid-Atlantic. The crow's nest, 70 feet above the sea, was filled with water, tons of which dropped on the decks. The bridge was wrecked, the chartroom was badly damaged, and the officers' cabins were flooded. The opposite extreme is illustrated by the experience of the U.S.S. *Kittery*, which passed through the middle of a waterspout in the West Indies. On the deck of the vessel only a fine mist was observed in the air. Another spout, which came in from the Pacific at Tatoosh Island, Washington, in 1917, struck the face of a cliff and, according to witnesses, "utterly vanished like a burst bubble," without producing a downpour.

It is probably the rule rather than the exception that waterspouts occur in groups. The conditions that produce one are likely to produce others, and in fully half of all the recorded observations of waterspouts two or more were actually seen simultaneously or within a short time of one another. In some cases as many as thirty have been sighted from a vessel in the course of a single day.

A remarkable case of multiple waterspouts was

A waterspout seen on Lage Zug, Switzerland, in 1905

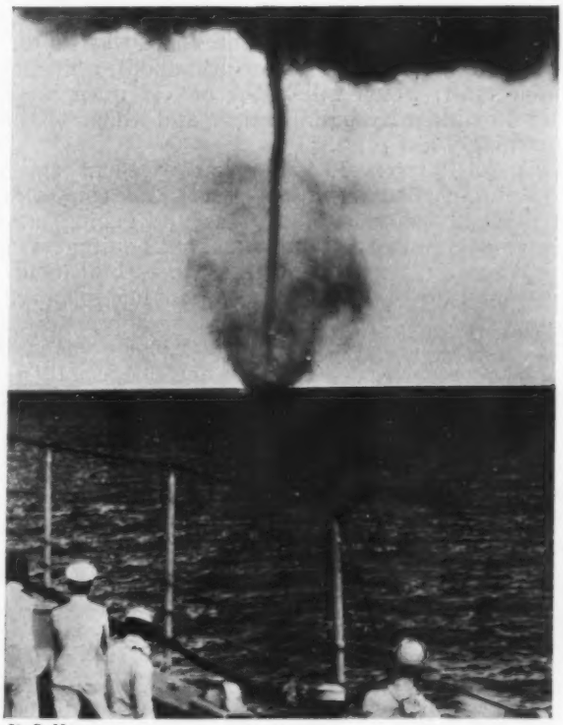
reported a few years ago to the British Meteorological Office by J. B. Hewitt, chief officer of the steamship *Carston*. About five o'clock one afternoon, while near Guantanamo, Cuba, the ship ran into a severe thunderstorm. Hardly had this subsided when the clouds began sending down tapering arms on all sides of the vessel, and several of these formed complete waterspouts. Finally there were nine large spouts, perfectly formed, within a short distance of the ship.

Then a curious sight was witnessed. Around some of these spouts two or three — and in one case four — slender, weedy-looking spouts were formed. They not only traveled with the big spouts, but at the same time circled slowly around them, after the manner of satellites revolving around a planet. Their movements were erratic; sometimes they approached the central spout, sometimes receded from it, at the same time undulating violently. Some of them collapsed before darkness and increasing distance put an end to the strange spectacle. A similar movement of satellite vortices around a primary has sometimes been reported in connection with dust whirls on land.

The visible features of a waterspout may begin with a feeler-like protuberance descending from the clouds above or with a revolving mound of spray and vapor at the surface of the water; or, again, both these manifestations may be seen at one time. On the morning of August 13th, 1930, the British steamship *Oronsay*, while in the Red Sea bound for Suez, sighted six waterspouts within half an hour, and one of these was seen to form near the ship.

"Our attention," writes an officer, "was attracted to what at first glance would appear to be the usual commotion of a shoal of fish disporting themselves close to the surface. No rain was falling, though thunderclouds were 4,000 feet or more overhead. As it swept by, only 200 feet off our starboard side, traveling in a southerly direction, we were able to notice its subsequent phases. The apparent commotion was caused by wind rushing 'round in a small area, the wavelets thus caused falling inward toward the center. We felt the violent gusts blowing toward it as we passed. A fine spray was starting to form, like a cloud of steam, above it to a height of a few feet. When a few miles astern, this became more dense and the sea it encircled much more disturbed. Within ten minutes or so of its passing us a spout was observed coming from the clouds, and a few minutes later the whole joined, making an enormous waterspout."

The smallest waterspouts are mere whirligigs of spray or short columns of spray and vapor, seen waltzing over the surface of the water, often with a clear sky overhead. These surface spouts have been distinguished by some German authorities as *Kleintromben*, and in English as "pseudo-waterspouts." Fully developed spouts vary widely in size, the average height being about a thousand feet.



U. S. Navy

An excellent picture of a waterspout taken from the "U. S. S. Pittsburgh," at the mouth of the Yangtze River, China, in 1928

Firing on a waterspout — a practice founded on superstition. From Fonvielle "Éclairs et Tonnerre"

An extraordinarily tall waterspout was seen off Eden, New South Wales, on May 16th, 1898. Theodolite measurements made on shore indicated a height of 5,014 feet. The cones at base and summit were each about 250 feet long and 100 feet wide at their greatest diameter, while the rest of the column was only 10 feet in diameter. In proportion to its height, this was probably the slenderest waterspout ever observed. A spout

(*Continued on page 104*)

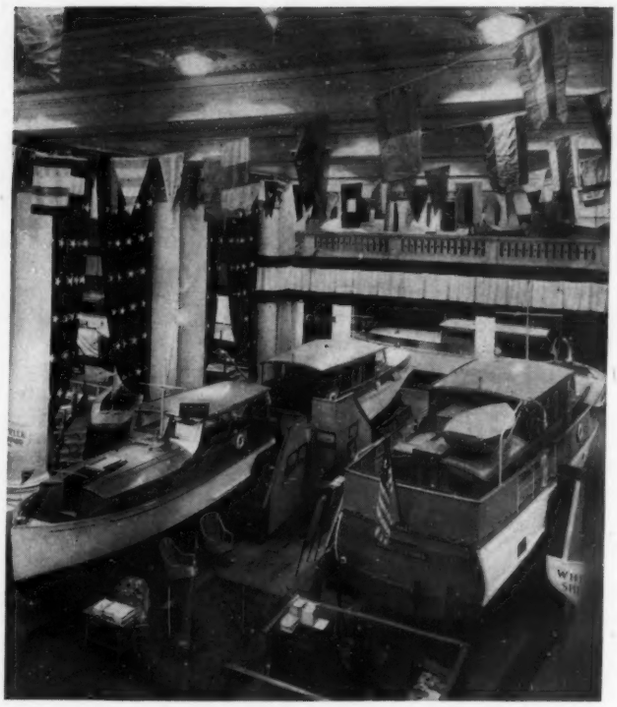
At the Motor Boat Show

THOSE doubters who predicted that a motor boat show held under existing economic conditions would prove a "flop," underestimated the public interest in this annual exhibition of boats, engines and those accessories that make life afloat so alluring, and failed to take into account the hold that boating has on its devotees.

In point of fact, the exhibition this year was fully up to the standards of preceding shows, and while there were fewer exhibitors, the quality of what was displayed in no way suffered by comparison, and there was less crowding of boats and engines in the booths, a fact that was much appreciated by those who came to look and inspect. The first floor of the Palace was given over to cruisers, sailboats — of which there were more than in any previous Show — and those Diesel engines too heavy to get on the upper floors.

The cruisers this year were a particularly fine lot. Two outstanding facts were apparent: first, the trend towards sturdiness and utility, and the substitution of paint for the highly polished, piano-like finish seen so frequently in the past, and, second, the increased number of smaller boats within the reach of the man who must count the cost of his boating. Both of these are healthy signs. Also, the lower price range in the runabout field was noticeable.

Most of the exhibits were fully covered in the January issue of YACHTING. In some cases, however, builders were not ready to announce their new models in advance. For instance, there was the a. c. f. De Luxe 46-foot cruiser. In appearance she was one of the outstanding boats at the Show. The dull black finish of the hull was set off by the lavender gray cabinhouses and a green dinghy carried aft, — a most pleasing combination of colors. The after cabin was exceedingly spacious and well arranged, with an unusual lighting system. The boat represents the custom finish given by the a. c. f. to their standardized models. A Hall-Scott reduction gear motor gives 16 miles per hour.



Some of the cruisers. At right is the 50-foot Wheeler Diesel, equipped with one of the new 100 h.p. Wintons

Then there was the 1932 Dodge fleet, first shown to the public at the Show. Two years ago the Horace E. Dodge Boat and Plane Corporation astonished showgoers by presenting their famous 16-foot runabout at a remarkably low price. This year another surprise was in store for the big crowd which visited the comprehensive exhibit. For in addition to half a dozen fine runabouts and sedans, ranging in size from 16 to 28 feet, and speeds of 18 to 48 miles an hour, there was the brand new Dodge 19-foot All-Purpose Runabout, a fine, comfortable craft, which will knock out 18 miles an hour with a 4-cylinder Lycoming motor, and which sells at an astonishingly low price.

This All-Purpose 19-footer has excellent stability with her ample beam, will seat eight people comfortably, and is ideally suited for camping and fishing parties. Both models have the usual runabout equipment, plus lifting rings for ease of handling. The accompanying photograph shows the fine appearance and roominess of this newcomer.

Another new one is a 19½-foot runabout which does 34 miles with a new model 6-cylinder Lycoming motor, built throughout of Philippine hardwood, finished bright, with double cockpit forward and single cockpit aft, and a total seating capacity of nine people. In line with all 1932 Dodge boats, this Model 204 is quite moderately priced. Model 205-A is the same hull, but with 115 h.p. straight eight engine, 38-mile speed, and single cockpits forward and aft, seating six.

Still one more new one is Model 206, a 23-footer also built of Philippine hardwood. She is pow-

The 46-footer by a.c.f. was effectively displayed, a black and gray color scheme being most attractive

ered with a 6-cylinder 90 h.p. Lycoming and does 30 miles an hour. A sister boat is powered with a 125 h.p. straight eight engine and will knock out 34 miles an hour.

Others in the Dodge line are:

Model 208, 25½-footer, built of oak and African mahogany, making 36 miles an hour with 165 h.p. straight eight Lycoming motor.

Model 208-S, sedan model, same hull as Model 208.

Model 209, custom-built 25½-footer, powered with new V-type 325 h.p. engine, speed up to 48 miles an hour.

Model 210, 28-foot runabout, 165 h.p. straight eight motor, speed 34 miles.

Model 210-S, 28-foot sedan, same hull and power plant as Model 210.

Model 211, 28-foot custom runabout, V-type 12-cylinder motor of 325 h.p., speed 46 miles an hour.

Model 211-S, sedan, same hull and engine as 211.

The Chris-Craft Company sent on ten boats from Algonac, and they made an impressive and interesting showing.

Two single-cabin cruisers were the largest of the fleet, both being well arranged to give the greatest comfort and convenience for their length. The larger of the two was a 36-footer suitable for extended cruising, and the smaller a 31-footer. In model, they were of the V-bottom type, with large cabins, roomy after cockpits and plenty of deck room. In price, they offered great value for the money. Chrysler engines furnish the power, 106 h.p. in the larger model, and 80 h.p. in the smaller.

In this year's runabouts Chris-Craft is emphasizing the level riding qualities of the boats. Gone are the days when the stern settles at high speed and the bow lifts until it is impossible to obtain a clear view ahead over the stem. And while speeds have been increased somewhat, prices have come down appreciably.

The smallest of the runabout fleet is Model 300, a 15½-footer of excellent design and finish, which steps out at 32 m.p.h. and sells at the low price of $795. Next in point of size is Model 301, 18 feet long, with ample seating capacity, and a speed of 30 m.p.h. The price is slightly over a thousand dollars, which for this size and speed is indicative of the current price levels.

Chris-Craft runabouts of all sizes, from 15½ feet to 27 feet

The new 23½-foot runabout of the Dodge line. She steps along at 30 m.p.h. with a 6-cylinder Lycoming

Another new Dodge is this 19-foot all-purpose boat. Moderately priced, she is handsomely finished and does 18 m.p.h.

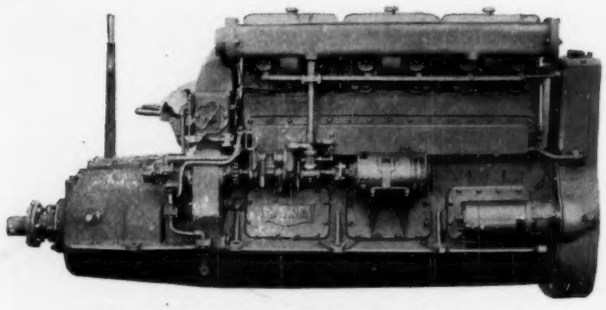
The other models shown by Chris-Craft were No. 302, 18 feet, 36 miles; Model 303, 21 feet, 32 miles; Model 304, 21 feet, 32 miles; Model 305, 21 feet, 36 miles; Model 307, 25 feet, 38 miles; and Model 309, the largest runabout shown, 27 feet in length, with a speed of 45 m.p.h. All of these have the level riding qualities stressed by the builders, and are all-mahogany jobs, with excellent leather upholstery, and deep spring seats. They are powered with Chrysler motors in the smaller models, and Scripps or Chris-Craft engines in the larger.

The Dauntless Shipyard, of Essex, Conn., had a fine 21½-foot one-design sloop from designs by Sparkman & Stephens, which they are building for the Madison Beach Yacht Club, as a racing class, and in a small tank of water, to show that it really floated, was the little Puddleduck sailing skiff, with a dark blue spritsail, an outfit that caught the eye of the embryo sailor.

The Engines

On the ground floor the simple, efficient rectangular lines of the big black Superior Diesel engine attracted the eye of showgoers. Ordinarily, all working parts are entirely enclosed to give silent operation but at the Show several crankcase side-plates were removed and replaced with glass to reveal the rugged internal construction of this 6-cylinder heavy duty engine.

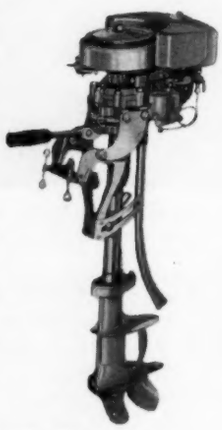
This design incorporates many new and distinctive features which give flexibility and quick acceleration with governor control at all speeds. Engines of this general design are built reversing, in 5-, 6- and 8-cylinder models. They operate on any suitable grade of fuel oil, consuming about .40 pounds per b.h.p.



The new 6-cylinder solid injection Buda Diesel

These engines are started with compressed air under a pressure of 150 to 250 pounds, and operate between 400 and 600 pounds per square inch. Constant pressure mechanical fuel injection is employed, assuring good distribution under varying load conditions.

One of the most unique and convincing exhibits in the Show was displayed by Chrysler to demonstrate their latest contribution to marine engine development — rubber suspension engine mountings which, by means of patented bonding of rubber to steel, developed by Chrysler engineers, make it possible to employ rubber under tension in supporting the motor. And to prove that this bonding process and the rubber itself would stand the tensile strain, a 4-cylinder Chrysler Regal model was suspended from a tripod by a single chain divided in two parts by one of these mounting connections which carried the entire weight of the motor in tension. Of course, in an installation, the motor is set in four such mountings connected near the base, and this demonstration merely was to prove that rubber bonded to steel by this special process is capable of supporting such heavy weights.



The little Caille outboard delivers 4 h.p. on a weight of 35 pounds

Heretofore rubber has been used under compression as a shim or cushion between engine supports and bed logs. The Chrysler method employs rubber under tension, so that the engine is actually suspended in, instead of resting on, its rubber mountings. This method takes the fullest advantage of the resilience of live rubber to absorb the noise and inertia forces set up in the engine.

In the new Chrysler 4-cylinder Regal, the rubber cushioning mountings are firmly secured between two portions of each supporting leg on the engine. On all other Chrysler models, the cushioning mounting is supplied in the form of engine support brackets which are fastened to the bed logs. The engine is then bolted down to the mountings. These mountings are optional on all models except the Regal.

The Chrysler exhibit offered a wider range of models than in previous years and included efficient power plants for everything from small boats to 70-foot cruisers. Outstanding was the new 56 h.p. Regal "four," because of its new rubber mounting, low cost and other practical features.

The Murray and Tregurtha oil engine which was introduced at the Show last year, and created so much interest, was again on exhibit in a 4-cylinder model. This new principle in internal combustion engine design, employing a patented nebulizer developed by Murray and Tregurtha engineers, has received a thorough try-out in numerous installations in yachts and commercial boats during the past year and in practical application has met all expectations.

A handsome pair of twin 6-cylinder 325 h.p., gasoline engines were displayed in the Murray and Tregurtha exhibit, together with their medium duty 6-cylinder model and the oil engine. The twins are specially designed for use in commuters and cruisers where speed and dependability are so necessary while the medium duty model is designed for cruisers, houseboats and commercial craft.

The long and popular line of Gray motors celebrated their twenty-fifth anniversary at the Show with a silver anniversary series, including eights, sixes, fours and a "single," ranging in power from 5 up to 144 h.p., which presented to the showgoers a motor for every boat.

The new Gray Phantom series presented a highly specialized design for high-speed work in fast boats. It was with a Gray motor that the *Phantom* made her famous record of 45.89 m.p.h. in the International 5½ Litre Class two years ago.

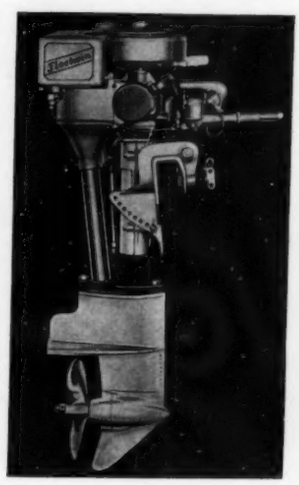
Gray also showed a complete line of heavy-duty cruiser, workboat and auxiliary engines, which will be known as the High Torque Series. These engines are all designed to turn large propellers at medium engine speed in slow and heavy boats, and are built in several sizes of fours, sixes and eights.

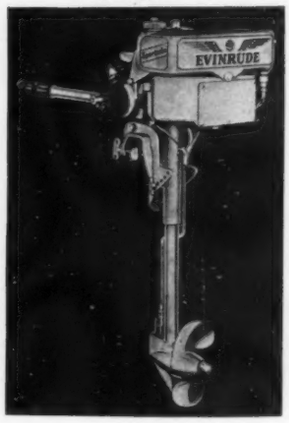
Along with the motors the Gray Motor Company exhibited, in working form, their Vee-drive which is rapidly gaining popularity along with the movement toward stern motor installation in runabouts and small cruisers. By employing the Vee-drive it is possible to increase the useful space in cruisers and runabouts as well as to add to sea-going qualities. A large number of these installations have been made and are proving their reliability in actual practise. The Vee-drive may be used on any type of motor up to 200 h.p. at 3000 r.p.m.

The big white Diesel engine designed and built by McIntosh and Seymour caught the eye of even those who had no particular interest in Diesels but who could not fail to stop and admire this massive but compact product of Diesel engine design.

This engine is fully enclosed like the other five McIn-

Two new Evinrude models, the Class A Fleetwin, and the 4 h.p. Sportwin





tosh and Seymour models, but accessibility to the working parts is in no way sacrificed. These motors operate on the simple injection system, and forced feed lubrication is built-in throughout. Combustion is smokeless, and complete enclosure of the moving parts with the use of an efficient silencer on the exhaust reduces noise to a minimum.

The rugged construction, fine materials and workmanship evident in this big engine assured those interested that lasting and uninterrupted service would be given by it and the other models manufactured by this firm.

Of special interest in the Buda exhibit was the Buda M.A.N., 125 h.p., lightweight, high speed Diesel engine. This 6-cylinder, 4-cycle, full Diesel engine operates on airless fuel injection and represents the latest development in high speed Diesel engines made by one of the original German Diesel motor manufacturers under whose patent license Buda is building this motor.

Alongside the Diesel engine were three of the popular Hivelo models manufactured by Buda. There was a compact 4-cylinder engine, which may be had in 48 or 56 h.p. installations, and a 6-cylinder engine in 70 or 81 h.p. models. The largest of the Hivelo series on display was the 6-cylinder model available in 97, 101 or 105 h.p. units.

Some Outboards

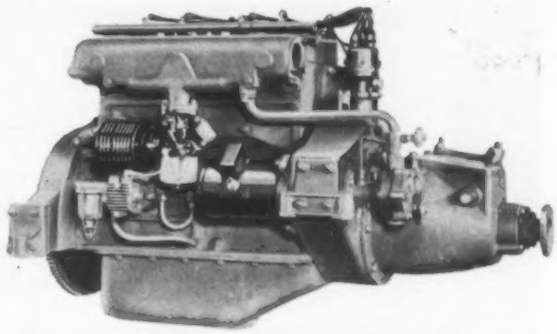
A display of outboard motors to suit every purse and purpose was presented by the Elto and Evinrude Divisions of the Outboard Motors Corporation. Elto showed three splendid new utility motors and introduced many new mechanical refinements in their service and racing models.

The new 39-pound 4 h.p. Elto, known as the Fisherman, was of wide popular interest because of its all-around utility for family use on rowboats, canoes, catboats, and dinghies, or, as its name implies, for the fisherman.

The 1932 Elto Lightweight contains refinements that enhance its appearance and performance. It retains its oversize muffler, which makes for quiet operation, and, like all Eltos, it is equipped with battery ignition.

Two new Class A Eltos made their début at the Show and were well received. Service "A," a new 8 h.p. motor, is a successor to the Service Twin but with greater power. It weighs less than 60 pounds. The new Super "A" is an 11 h.p. motor that can best be described as a small edition of the Elto Super "C." The heart of this new motor is in the internal gearless rotary valve developed by Elto.

The new Elto Service A and Fisherman models, the latter priced under $90.00



The new Chrysler Regal marine engine, with rubber cushioned mountings to absorb vibration

For the man who wants an outboard for runabout or cruiser, Elto displayed their super "C" with rotary valve, underwater silencer, primer for cold weather starting and other practical features.

A handsome display of 4-cylinder outboard motors represented the well-known Elto Quads. The Junior Quad, a 75-pound motor of 18 h.p., incorporates all of the practical Elto features with the quietness and smoothness of a "four." The Senior Quad, designed for use on runabouts and cruisers, develops 35 h.p. and is the most powerful of the Elto service motors.

The Evinrude Division of the Outboard Motors Corporation presented three new motors in their attractive exhibit — the Sportwin, Sturditwin and Fleetwin — and displayed six service models and two racing motors.

The new 4 h.p. Sportwin, 8 h.p. Sturditwin and 11 h.p. Fleetwin are designed for use on small and medium sized outboard boats. The Sportwin weighs only 43 pounds and is ideal for the fisherman who must transport his gear in train or car. In this same class Evinrude displayed their well-known 4 h.p. Lightwin.

For those whose boats are larger Evinrude has designed the new 8 h.p. Sturditwin built for hard and continual use. The other new Class A outboard presented by Evinrude was the Fleetwin, an 11 h.p. motor embodying all of Evinrude's popular features.

Fastwin, the 14 h.p. motor that holds the endurance record of 662 hours in continuous operation, retains its enviable place in the Evinrude line, along with the 22 h.p. Speeditwin which holds the second highest endurance run of 644 hours.

To complete Evinrude's splendid exhibit of stock motors there were two 4-cylinder motors, the 18 h.p. Sportfour and the 36 h.p. Speedifour.

Outboard enthusiasts gathered around the Caille exhibit to see one of the latest advances in the development of outboard motors known as Multi-Flex control, or, in other words, a gear shift. Now, an outboard-powered boat can be handled with the ease and maneuverability of an inboard motor boat.

By pressing a button at the end of the steering handle and moving the handle up or down into notches, three different speeds and a neutral may be obtained. High speed forward, trolling speed forward, neutral and reverse are effected by a simple movement of the arm. The change of speed from forward to reverse is obtained by changing the pitch of the propeller, and, when the blade is in the neutral position, it acts like a brake.

(Continued on page 90)

M. Rosenfeld

This able Diesel cruiser was designed by Tams, Inc., for A. C. Murphy, of New York, and was built by George Lawley & Sons Corp., of Boston. The dining saloon is in the forward deckhouse with ample light flooding the attractively panelled room. The living room centers about the wide fireplace, the white finish adding to the cheerfulness. "Shogun" is powered with two 375 h.p. Winton Diesels

"Shogun"

A 130-Foot Diesel For Offshore Cruising

The 14-Foot Dinghy Class jockeying for a start in a bobble of sea on Lake Ontario

The International 14-Foot Dinghy

By JOHN S. BARNES

WERE I an "Alf" Loomis when it comes to describing the virtues of a boat, the Bermuda Race Committee would undoubtedly see looming through the fog off Sarah's Ledge next year a valiant fleet of 14-foot sailing dinghies battling with *Dorade*, *Mistress*, *Jolie Brise* and the rest, for position on the starting line. But the committee need lose no sleep this winter for, while I do not doubt that the little ships could make the trip, I am quite sure I cannot do them justice.

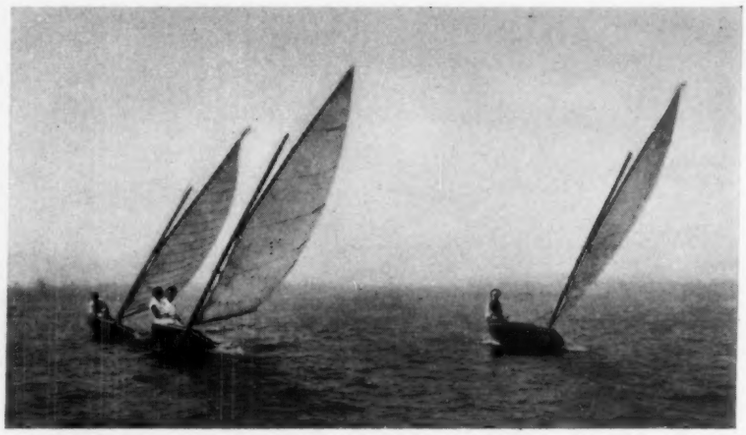
Calling so able a craft by such an insignificant name as "dinghy" is one of the great crimes of the modern sailor. I can stand most of his idiosyncrasies, but not this. The term brings to mind that very essential but unattractive adjunct to a sailor's life, the yacht tender, which may be anything — usually a flat-bottomed punt with noisy outboard, or a canvas-covered chopping bowl. When I speak of the 14-foot International Sailing Dinghy I am referring to one of the sweetest boats ever conceived by man. Only 14 feet over all, but an honest-to-goodness sailor, she knifes out to windward like a Six-Metre, and is astonishingly fast on all points of sailing. To see and to sail one is fatal. It will steal your heart away. But I shall try to fight off that sailor's weakness of praising his own love to the sky, and deal only with cold facts. If at times I seem to give way to pure enthusiasm it is because I have learned to look on these little ships with the devotion one reserves for his closest and most understanding friend. You will look far and wide to find their equal in anything like their size.

The class is not new. Dig out the copies of YACHTING for 1916 (if the womenfolk have not thrown them away) and back fifteen years, when the New York "40's" were in their first season, and the Marconi rig was an experiment, you will find designs of many dinghies, along with other small one-design classes, then popular. Where are those classes today? With the exception of the Star and the Dinghy, they are gone, or at least are no longer sailing as a class. New designs have taken their place. This fact alone is significant. Time has told its story.

On Lake Ontario, where I know the class today, there are well over 200 of these boats in use, and the sailor's interest never wanes for lack of competition. Nearly every club on the lake has a fleet which keeps activity humming. There is an open class, and a one-design, which is shown in the accompanying drawing. The open class boats are built to hull restrictions and have slightly finer lines, as well as a Marconi rig. Some have *Enterprise* booms, trick tilting centerboards, and other impressive gadgets. There is no reason why the one-design boats could not be Marconi rigged, but so far they have stuck to the high gaff, and there is much to be said in its favor. There is little loss of efficiency, which is of no consequence in a one-design, and it is much simpler to lay up than the Marconi rig, with its multiplicity of stays. The entire rig of a gaff boat may be put on or taken off in about five minutes. Both classes carry only a mainsail of 140 square feet. This sail plan is, I think,

Lake Yacht Racing Association officials watching from a power boat a race between 14-foot dinghies

preferable to the jib and mainsail in a boat of this size. A crew of skipper and one is kept pretty busy handling the sheet and the centerboard, which takes continual shifting when racing. I also question the efficiency of a sail as small as the jib would be on a dinghy. Therefore, the added cost would hardly be justified.



Sailed with a crew of two, the 14-footers make an excellent racing class. They are very popular on Lake Ontario

Of course, the open class sailors will tell you that theirs is the only class to sail in, and we are forced to admit that it is to the open classes, in dinghies as well as in the other types, that we are indebted for the present high development of design. But after a good design is developed, I am rather likely to say "Thank you, sir," and stick to the one-design. I cannot afford to have my boat frequently out-built, and I like the idea of the contest being one of pure sailing ability. The boat I am sailing is eight years old, and I think quite as good as she ever was. To one who must consider cost, and who takes his pleasure in sailing, and not in developing designs, I think the one-design class offers a greater return on the time and money spent.

In all cases with which I am familiar the boats are beautifully built, and constitute a highly finished product of the builder's art. They inspire great pride of ownership, and as a class are unusually well kept.

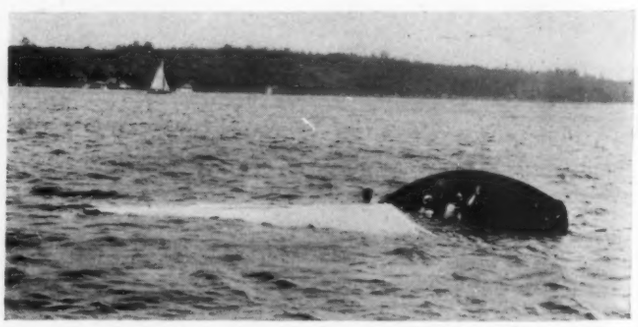
An International 14-foot dinghy with Marconi rig. Many of the boats now use this rig

Nervous parents will often inquire if the boats are safe. They most decidedly are. Last year I saw four of them nursed through a squall that sent many large boats to shelter with damaged rigging, and only this summer an experienced small boat sailor turned to me as we watched a fleet banging its way around a course in heavy going, and exclaimed, "Is there no end to what they can stand?" I have taken one across the end of Lake Ontario, where at times we were ten miles offshore in a good stiff breeze, and I have seen them miles away from home, actually on a cruise, sometimes two or three together, sometimes alone.

Yes, they are safe; but right here I should like to state that the idea of a fool-proof boat is quite ridiculous. This year I saw two boats of a class widely advertised as non-capsizable, non-sinkable and otherwise safe for children, sink at their moorings. I have seen so many boats fitted with bulkheads and air tanks sink, with apparently a perfectly clear conscience, that I have grown to believe these devices cannot be depended upon to keep a ballasted boat afloat. Sailing is not a dangerous sport — much less dangerous than football, horseback riding or automobiling. But I contend that an unballasted boat which you know cannot sink is by far the safest type of small open craft. I also contend, as most people do, that the greatest possible safety measure is thoroughly to understand the game and the conditions under which you are playing it. This the dinghy will teach one more quickly and thoroughly than any other type yet developed because it is fast, lively, and quick to respond to slight changes of trim, balance and technique of handling. The effects of these things are greatly emphasized and, consequently, are readily recognized and quickly understood.

A dinghy will capsize, and if you sail one long enough, you will quite likely find yourself in the water at some time or other. That's part of the sport. When they do go over they float high and are easy to manage. By all means give a boy or girl an unballasted boat for his first one. Its speed and sensitiveness to balance and touch are the very essence of sport, and if he knows it can tip over he will sail it better, rapidly becoming an alert, clever, wide-awake sailor. When he is through for the day he can pull her up on the beach or into a boathouse or shed, where she is safe and off his mind.

To substantiate these thoughts I could do no better than to quote Mr. Edwin Boardman's fine work entitled, "Yacht Racing." Mr. Boardman has had long



One may get a capsize, but the boats are unsinkable and float high out of water

experience in every type of boat, from America's Cup defenders to the little dinghy, and his opinion is respected everywhere. In speaking of the "tiny little unballasted boats," he says:

"It has been my experience through many years of contact with these little boats that for real fun they supply a want that is not even equalled in the larger classes. . . . I have often thought, as have many others, that the real way to learn how to sail a boat, to get the feel in the right way, and to appreciate fully the conditions under which one sails, is to use an open boat that is small, capsizable and very fast, and one in which the management and live ballast are the means of keeping her upright and on her feet, so preventing her from tipping over or filling up. Many of the crack sailors of today began their careers in this sort of small boat; by the time they had learned how to handle it and were ready to take over one of the larger, more elaborate types of boat, they usually knew something about the sailing game and fully realized the need of good management in order to win their share of victories. Small details in connection with the little craft are tremendously magnified to obtain good results, and the lessons learned at that time always stand one in good stead, no matter in what type of boat one may eventually do his racing. . . . Say what you will, and think what you like, for real downright fun, little boats of this kind deliver more to the square inch than any other type of yacht."

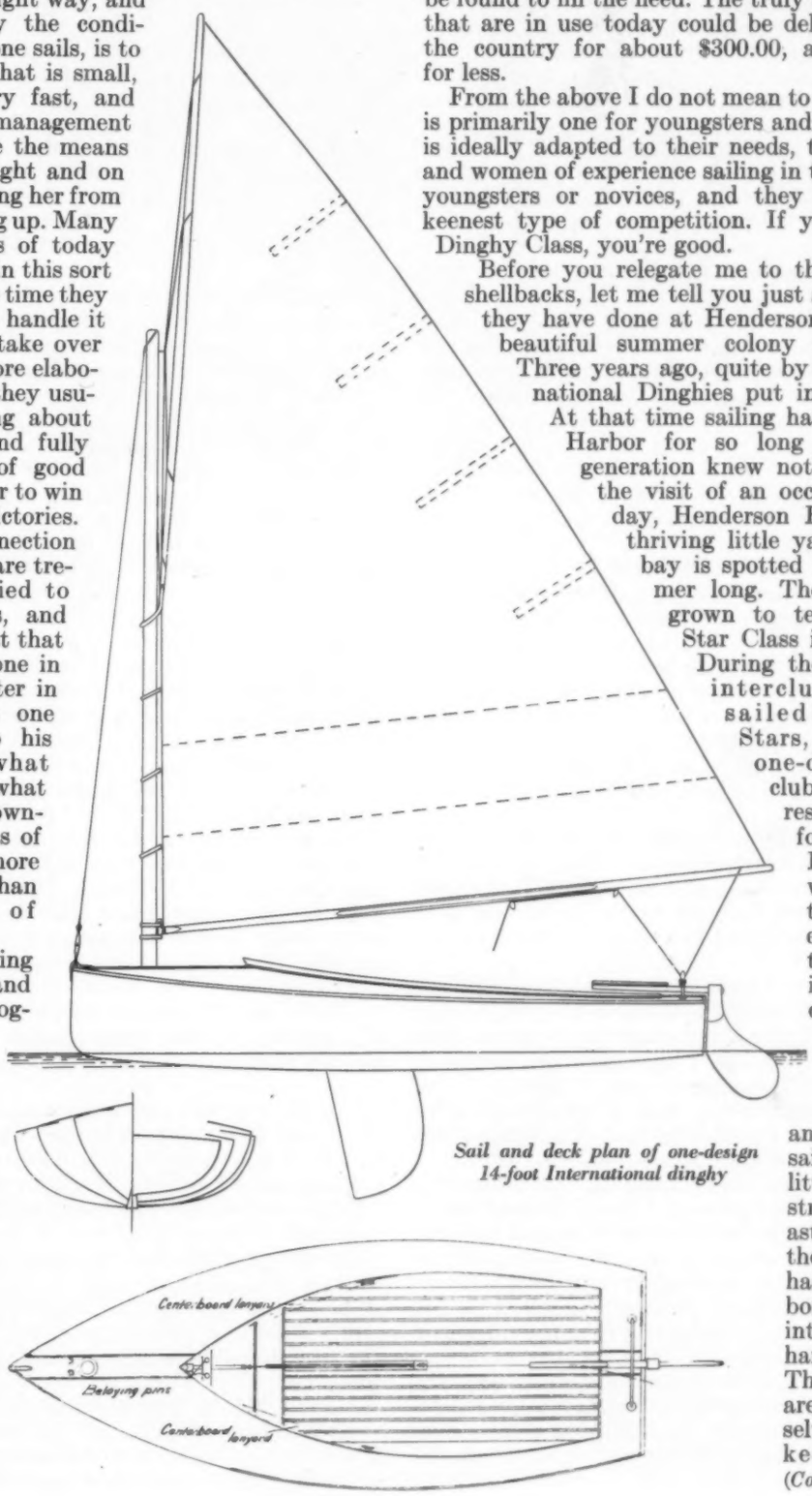
The value of sailing as a sport for boys and girls is generally recognized, and the benefits to a club which encourages junior classes are understood, but there is one phase of this subject which has not been emphasized. That is the immediate stimulus to club activities resulting from the establishment of a class of small one-design boats for beginners and youngsters. Such a class will keep a club buzzing with life, not only on week-ends, but during the week when the larger boats are of necessity deserted at their moorings, and a depressing silence has descended.

Most organizations have used boats somewhat larger than the 14-foot International sailing dinghy to fill this need, but I think this is a mistake, or rather I should say that they still have room for the dinghy. The boats of such a fleet should be as inexpensive as possible, and certainly nothing less expensive than the dinghy can be found to fill the need. The truly beautiful little ships that are in use today could be delivered anywhere in the country for about $300.00, and at most places for less.

From the above I do not mean to imply that the boat is primarily one for youngsters and beginners. While it is ideally adapted to their needs, there are more men and women of experience sailing in the class today than youngsters or novices, and they are producing the keenest type of competition. If you can win in the Dinghy Class, you're good.

Before you relegate me to the list of garrulous shellbacks, let me tell you just a bit of the fine job they have done at Henderson Harbor, N. Y., a beautiful summer colony on Lake Ontario. Three years ago, quite by chance, two International Dinghies put in their appearance. At that time sailing had been dead at the Harbor for so long that the present generation knew nothing of it save for the visit of an occasional yacht. Today, Henderson Harbor boasts of a thriving little yacht club, and the bay is spotted with sails all summer long. The dinghy fleet has grown to ten boats, and the Star Class is also represented. During the past season four interclub matches were sailed—in dinghies, Stars, and an 18-foot one-design of another club. Three of these resulted in victories for the Henderson Harbor sailors who had had less than two seasons' experience. But the most pleasing aspect is the change that has come over the community. People unable to take an active part in the sailing, and knowing little about it, are strong and enthusiastic supporters of the sport. New life has come to the Harbor through the keen interest taken by all hands in the racing. Those who are sailing are teaching themselves through their keen interest and

(*Continued on page 110*)



Sail and deck plan of one-design 14-foot International dinghy

"The North Wind Do Blow"

By CAPT. GEORGE E. ANDREWS

"THE north wind do blow," or so my memory recalls an old nursery rhyme which went on to say "and we shall have snow." I can vouch for the fact that the north wind *can* blow, and under the proper conditions and circumstances it usually proves a vicious and unrelenting enemy to the sailor, who, by accident or design, accepts the gage of battle.

In 1886 one of the most destructive late November gales, ever known up to that time, ravaged the upper Great Lakes. It was particularly bad on Lake Michigan and Lake Superior. It took the favorable breaks of the game, a one-hundred-per-cent outfit, an able ship and rare seamanship to fight a winning battle with that 125-mile-an-hour raging wind, packing a terrific wallop in itself and more than aided by blinding snow squalls and extremely low temperature.

As an active participant in a battle royal with this roaring devil, I hope my story of the incident, out of which we emerged battered and worn, but triumphant, may prove of interest to readers of YACHTING. Extremely bad conditions, worse breaks and several unusual occurrences, all contributed to make the fight to save a fine ship, the three-masted schooner *Nellie Redington*, commanded by my father, Captain J. H. Andrews, dramatic. It was an accident that brought me into the picture at all.

Several years previous to this I had quit sailing ships in disgust after a downward passage from Escanaba, Michigan, to Cleveland, in December. I left with the ends of my fingers of the left hand frozen and split, vowing "never again." In late November, 1886, I was enjoying a duck shooting trip at Calumet Lake, a few miles out of Chicago, when I received a telegram from my father, who was at Milwaukee, urging me to run over to say "Hello," and asking me also to stop in Chicago on my way and order a new forestaysail for the ship.

I accepted the invitation. I soon wished I had not, for after our greeting my father urged, "Come along with us, Ed. We're going to Escanaba, light, for a load of ore to Cleveland and we'll be there in ten days. Just as a passenger, you know." And he grinned. "We'll have a good visit."

"Passenger — huh!" I grunted, but — I accepted.

We towed out of Milwaukee the next morning and as we passed out the harbor, the crew was busy bending the new sail. Which was lucky, for that new sail was to prove our salvation, although no one realized it at the time. It was a beautiful day with a light beam wind from the west. Packed to her trucks with canvas, the *Nellie* slipped up the coast.

The Captain caught me staring at the barometer hanging in his room and grinned. "Yes, I noticed that."

"You did, eh," I grunted, "and what do you think of 29.16 in this latitude at this time of the year, and the glass still tumbling. Just answer me that, Dad!"

"We'll be in Escanaba in the morning," was the reply, but I plainly saw that 29.16 had been fully digested as trouble — quick trouble.

In two hours the wind hauled northwest and the *Nellie* was staggering off into the lake on the port tack, under shortened sail. As we gradually left the land we began to fight those nasty, sharp seas so characteristic of the Great Lakes.

Now, a big schooner, close-hauled, flying light and with a side out of water, like a skyscraper, is one thing, and making anything that resembled windward work, is quite another. Hanging on that big centerboard entirely, the ship was looking no closer to the wind than seven points and was going sidewise like a hog to war.

And still the glass tumbled downward. At four bells that night it read 29 inches, and the wind hauled again — due north. The ship was now down to two jibs and the three lower sails, single-reefed. "Passenger!" Gosh! I had been pressed into service at the wheel to furnish another strong pair of arms in the sail furling. There was no weather shore now. The big seas were running straight down the lake and she was indeed busting them wide open.

At ten o'clock we went about; that is we tried to go in stays, but the old lady positively refused, so the old man wore her around to the starboard tack, and back to the west shore we staggered and slopped.

"Dad!" I yelled into the old man's ear, "why don't you beat it on the dead run for Chicago? I would." The only answer was a shake of the head sideways.

Then came the snow. Snow, driving snow, that curse of the Great Lakes sailor, pushed by a hundred-mile gale. It was no soft sugar snow that melted when it struck, but pellets the size of number eight shot, traveling as though, indeed, they had been fired from a gun.

Well, I was in for it, and I found myself snorting in disgust at the "sap" I had been when I gave in and accepted that invitation to go sailing again.

We were now carrying too much after sail, and began the wearisome task of close-reefing the mizzen. It took two hours; everything was stiff with ice. The thimble of the tack was filled up solid. We couldn't find any hole through which to pass the lashing. It was the same on the leech, and the reef points hung as big as coupling pins, coated with solid ice. Nothing but salt would soften the ice, but we finally did the job.

What a night! Never shall I forget the roar of that gale now well over one hundred miles an hour. I can still hear the hiss of the frozen spume as the seas burst and swept away to leeward, and I can visualize the huge, snarling, white-topped green mountains of water.

The schooner was no longer making any progress to windward. She simply wallowed, luffed, paid off and slid sideways. Then things began to happen. With a terrific crash, that tremendous centerboard, 48 feet long, 16 inches thick and edge-bolted through every oak plank, sheared off under her bottom and tore loose at the pin. Some strain that! The ship shivered as though she had been struck her death blow and now was entirely helpless as to handling. Nothing could be done except to start the mizzen sheet and box her off for the long run south.

So it seemed to all of us except the Captain, and the captain of a ship cuts quite a lot of ice — on his own ship.

We were now close in to the land. A flashing light, that should have been bright, showed through the snow like a big yellow blob.

"Twin Rivers," the old man growled in my ear.

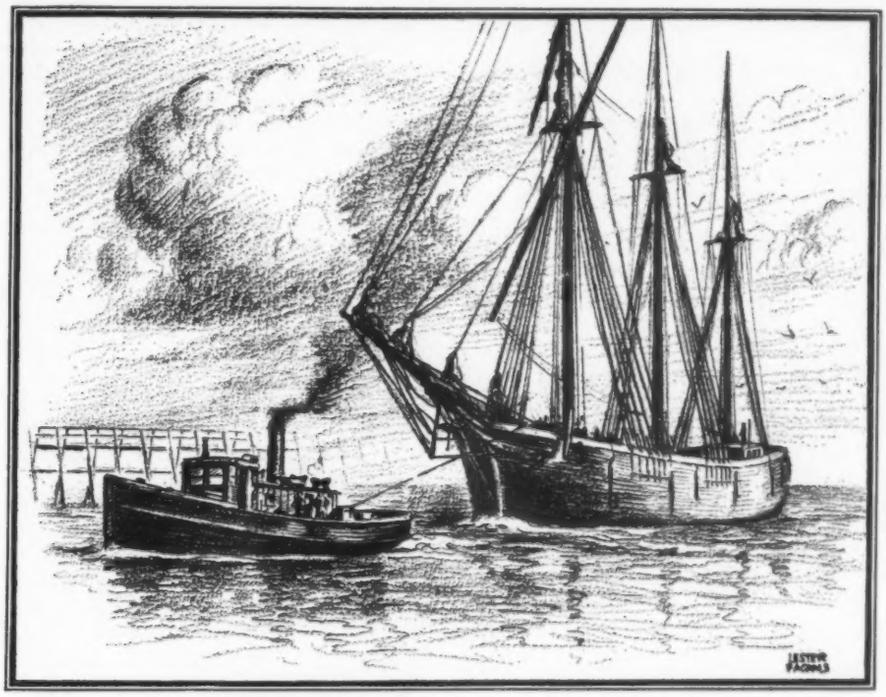
He crawled forward and I followed close on his heels. There was no question of doing any walking; we simply crawled. I heard him bawl an order in the mate's ear,

but was unable to distinguish the words. It proved to be a command to get the big anchor ready. That anchor weighed over two tons.

I found the Captain and the mate crouched down in a coil of hawser, under the forecastle head, out of the

I remember well how I caught myself sucking in my breath in excitement as the old man bore down on the windlass brake.

That 500 feet of huge linked chain straightened out in a quivering line to the anchor as the ship was slowly



"Then came the tug. She had stood by night and day waiting a chance to help us, but wisely stayed inside." Drawn from a photograph taken 45 years ago

thunder of the crashing gale. "Don't make any mistake, now," I heard the Captain say. "Remember, I want the big anchor; see that it's geared to its own side; then get the small anchor ready."

That was plain enough. It seems incredible that the mate, given such cool and positive orders, could have erred. He geared the big anchor on the wrong side and, as we were now stirring up the yellow sand as we were hove to leeward, my father, with his own hand and a spike maul, knocked out the pin at the cathead. With a roar of iron against iron, that big hook plunged to the length of its slack chain and fouled, bringing up with a jerk that shook the ship to her keel before it ever reached bottom.

Then, a master mariner showed himself. In a split second, the Captain disappeared under the forecastle deck. Never a quiver of excitement; simply fast action, almighty fast.

In twenty seconds, he reappeared, jumped to the lee cathead and knocked out the pin that held the small anchor. It disappeared on the weather roll. Then he jumped to the windlass brake bar. There was a stream of fire for twenty feet along the chain as it blazed out the hawse pipe. Nor did the old man stop it until 80 fathoms had run, and then we were not 500 feet from the beach.

Now, any sailor who reads this yarn, knows well what supreme judgment must be used in snubbing a 3000-ton ship in a 125-mile gale, particularly when that ship is showing a side out fully 26 feet above the water. The *Nellie* was groaning and sobbing as though she was being unjointed.

Despite the storm, nearly every soul in Twin Rivers was on the beach, hoping and praying for our safety.

jerked head to the wind. How easy it would have been, with hasty judgment, to have parted that chain, strong as it was — and to part it meant certain destruction. I stood hugging a bitt and watched, fascinated. The old man never batted an eye, but attended to that job as if nursing a sick baby.

Long before this, our canvas, as thick as shingle butts, had sailed away in pieces, like huge white-winged bats, and now all three booms were on deck and lashed to prevent shifting.

It was up to the anchor now. There was one chance in a thousand, in that treacherous quicksand bottom, that it would hold and save us. Slowly the Captain snubbed her, and at last she rode head to wind, but making sternway; slowly, but surely, she sagged back and every huge sea knocked her a foot to leeward. We had but a few feet to go before she would strike. I got a cast of the lead, "up and down," and it showed the drift. The cable was now out to the shackle on the windlass bitt. We had indeed shot our bolt, and the treacherous quicksands of Twin Rivers showed no intention of relenting. All that mortal man, in the form of a prime seaman, could do, had been done.

Again the snow devils went to work. Though but 200 feet off the beach the shadowy land was blotted out as though covered with ink. Still, she showed sternway. It was a tough game. I tasted blood in my mouth. Must have bitten something flopping around loose.

Every sea slowly but surely drove her back. Still that great, taut cable hummed a dire tune. Under the lee of the after deckhouse my father said — and he said it with a strangled fury of impotence in his throat — "Well, Ed, I guess we're goin' to lose her. In less than an hour she'll strike aft; she churns the sand now every

time she drops into the hollow of a sea; if she strikes, that's the end; no human being can keep his feet when she hits. Damn it all!" and the old man blew his nose fiercely.

I looked with genuine distress into his bloodshot eyes, gleaming out from under the rim of his sou'wester, but to save my life I could not utter a word. God! what a five hours to daybreak.

Daylight, or what passed for daylight, showed us lapping the north pier to the river. The light was still blinking like a red bleary eye through the snow squalls; the entire population of the town was on the beach, just outside the spill of the sea; hundreds had stayed there all night, huddling over camp fires, and still the gale held.

Suddenly the Captain disappeared into his cabin. In ten minutes he reappeared with a covered tin pail and two hastily written telegrams. One was to my mother, and the other was to his lifelong partner, J. A. Redington, of Cleveland, for whose daughter the ship had been named. They told briefly that it was his belief that the ship would go ashore and be in pieces in several hours.

A terrific crash jerked us to our feet from the lee of the cabin. It had to be quite a crash to attract our attention, so fierce was the roar of the gale and the groaning of the ship. With one tremendous side swipe the schooner had slewed sidewise, sweeping the light into the lake with her projecting mizzen boom that was lashed amidships. The blow ripped out our rudder and sternpost, and as the ship passed clear of the elevated walk used by the light keeper to get out to his lamp in bad weather, our entire crew, except the two mates and the cook, leaped onto the walk and fled shoreward for their lives.

It was a good thing they could run. In ten seconds a huge, sand-shotted sea stormed over the walk. Had it caught them it would have snuffed them out like candles.

Lashing the cover on the pail, the old man crawled to the top of the cabin and held it up for ten seconds. Every eye on the beach was focused on him in fascination. As soon as he was sure that he had the proper attention, the captain heaved the pail into the air. The wind carried it 500 feet inland. In ten minutes the world had the news that the schooner *Nellie Redington* had gone ashore at Twin Rivers and all hands were lost. This last clause the operator must have added on his own account — a touch of the dramatic.

Once more the vessel passed the pier with a heavy crash and swung clear on the south side. Then, when we were all about resigned to our fate, we got a break — the first one so far in the battle. A fast running current from out of the river held her stern from swinging back, and there we wallowed like a drowning leviathan all that day and another night.

Then to the pumps. Those awful smashes and a sternpost knocked "galley west" had opened her up. We all pumped until our eyes popped. If we had had our crew it would have saved us grief aplenty.

On one of my relief turns I found my father staring hard to the westward. Suddenly he grabbed me by the arm and pointed. Plainly, for thirty seconds, a blue patch of sky showed in that direction — an almost infallible indication of a sudden shift of wind.

We crawled slowly and painfully down from the quarter deck to the main deck — all of us that were left. Then we broke out a barrel of salt and smothered the new forestaysail with it. The Captain again yelled and pointed. Our shift of wind had come.

The large combers were almost stopped in their tracks, and their breaking tops were whipped back in their faces, so to speak, by a wind that lost none of its intensity with the shift.

In an hour we had thawed out the new forestaysail, and by taking the halliard to the fore winch managed to hoist it about two-thirds up the stay, but not before they had hoisted me up in a bosun's chair to salt down the stay, which was coated to the size of a big log with ice. That half set new storm sail did the trick. In another hour our battered, but still game ship had sagged out over her anchor. She groaned and sobbed as she rolled with five feet of water in her — but she was still a good ship.

Then came the tug. She had stood by night and day waiting a chance to help us, but wisely stayed inside, for she would not have lived ten minutes out in the lake.

The photograph which served as the original for the illustration is forty-five years old. An enterprising photographer took it as we passed inside the piers. The Captain is seen on the cabin top and while the steersman does not show, it was I who steered her in.

In the picture can be seen the elevated walk over which the crew deserted. We had a merry time with that crew, or what the crowd left of it, but that's another story.

Weary days we waited for thawing weather, but finally we succeeded in stripping the ship of what canvas was left and at Twin Rivers we laid her up.

From a wood cut by Ellsworth Ford

ICE YACHTING ON THE HUDSON
1879

From an old wood cut made
from a drawing by M. J. Burns,
a well-known marine artist
of that period

"Seapine"—A 156-Foot Fast Diesel Cruiser

"Seapine," owned by Theodore C. Hollander, was built by the Bath Iron Works Corp., from designs by Henry J. Gielow, Inc. Her trim lines are suggestive of the smart speed of 20 m.p.h. which she makes with her two Cooper-Bessemer Diesel engines. Old pine panelling makes the main lounge attractive and cheerful, at the same time retaining a ship-like atmosphere to which the antique chart of the world over the fireplace gives an added nautical touch. The dining room done in pure white makes for simplicity. The broad cruiser stern provides an unusually spacious after deck which has been attractively and comfortably furnished

+ Propellers +

Their Development, Characteristics and Application in Different Types of Craft

By GEORGE F. CROUCH

IF YOU were to hand an unused propeller to a propeller manufacturer and ask him to tell you without looking at the number on it whether he made it yesterday or ten years ago I doubt that he could answer correctly. The standard propeller of today looks so much like those made years ago that even the experts cannot tell them apart. It is easy to tell propellers made by one company from those made by another, but to tell just the period when one was made is another matter. Many marine motors can be dated within a year or two, and the same is true of the hulls, but as far as the casual observer can see the propellers of 1920 and 1932 are twin sisters.

And yet in one way there has been the most astonishing development in propellers during the past ten years. This development has been brought about by the trend toward higher and higher motor speeds, not only in racing craft, but in every class, even including the deep, heavy-bodied auxiliaries. From the engine builders' point of view this is a real advance because he can sell a smaller, lighter and more powerful motor at a lower price. It pleases the owner because the motor takes up less room in the boat, is more flexible, has less vibration and is more economical than the big, slow-turning, heavy-duty models which were used in almost every boat not of the racing or high speed type. But it does put it all up to the propeller. The purpose of this article is to bring up to date some of the data on propellers and to extend it to the high-speed range which is being used today.

Propeller speeds in racing craft have jumped surprisingly. Only three or four years ago the 12,000 r.p.m. of *Miss England II* would have been considered a fairy tale. Where it will end no one can predict. Some of us, perhaps influenced by the older propeller theories and by the results of careful experiments made in well equipped laboratories, feel that the desire to turn the motor over as fast as it will go, and then some more, has been carried to an extreme and that there will be a return to a more reasonable speed of rotation. To put it in another way, some of us believe that *Miss England II* would have been a faster boat for her weight and power if her propeller speed had been less. And the same thing holds for many another racing boat.

Owners are deriving so much satisfaction from the little motors which they have installed in heavy cruisers and auxiliaries that they are here for good whether they are especially efficient for the job or not. The engine builders today combine the advantages of the high-speed motor with the propeller efficiency of the slow-speed type by building a reduction gear as a part of the motor. This is an ideal arrangement for the cruiser and auxiliary. Anyone who has tried it finds that the boat has more speed on less fuel than if a small high-speed propeller were used on the heavy, slow boat. There is no question but that the use of the reduction gear between the motor and the propeller will increase in popularity, slowly but surely.

During the past year or two I have been amazed to find some of the most archaic ideas about propellers still firmly fixed in the minds of many experienced yachtsmen. I have heard the most astonishing claims made for efficiencies far beyond anything possible even under ideal conditions. It seems that the time is ripe to go back to some of the basic ideas about propellers, find out what it is all about and then try to give some guide to the selection of a suitable wheel for a given boat and motor.

Before going further we should have a clear idea of what this "efficiency" is. In any device, or any machine, efficiency is the relation which the work — useful work — produced by it bears to the work given to it. Applying this to the propeller, it is the relation of the work the propeller does in overcoming the resistance of the boat to the total amount of work that the motor does in turning the propeller. The propeller is a far from perfect device, not so much from poor design or construction as from the limitations of the medium in which it works. About a third of the power given it by the motor is lost in friction of the water on the blades, in resistances due to the thick blades being pushed at speed through the water, in the formation of eddies and vortices behind the blades and, the greater part, in pushing a small mass of water aft at a relatively high velocity. Even the best propellers used on yachts and motor boats seldom have efficiencies as high as 68 to 70 percent, while the average is more nearly 55 percent.

The use of the propeller or screw to drive a boat is old, over a hundred years old. Way back in 1802 an English transport was fitted with a wooden propeller turned by eight men working on cranks. It pushed the heavy boat along at about three miles an hour. Ericson's first propellers were tried in 1836 and in 1849 the steamer *Great Britain* made a successful Atlantic crossing with a propeller installation.

Like many an old and simple, or apparently simple thing, the propeller has been the subject of attack by an uncounted army of inventors. It is almost impossible to put any twisted or distorted piece of metal on the propeller shaft, whirl it around and not have something happen. The boat is almost sure to move, and the inventor immediately claims great increases in speed and efficiency. But beware of novel and patented propellers, for in general they are no better and may be far worse than the regulation article. Unless one makes a careful study of the literature on propellers he has no idea of the immense amount of thought and research which have been given to this seemingly simple little device. Smooth accurate castings, careful balance both for weight and pitch, strong metal which holds its shape under stress, and proper blade shape and shape of blade section are far more important than any patentable ideas.

A propeller is nothing but a device for creating a difference in pressure on the front and back faces of the blades. This difference in pressure is what pushes the boat along and the total difference in pressure on all the blades is exactly balanced by the resistance of the boat. It follows naturally that if the boat is a big, heavy one, the resistance will be high, and if a small, high-speed

propeller is used — which is necessary if the motor is of a high-speed type — then every square inch of the small blades must carry a heavy load.

The difference in pressure is made up of two parts, a decrease below the normal pressure on that face of the blade which is drawing the water toward it, and an increase in pressure over the normal pressure on that face which sends the water aft. If the decrease in pressure exceeds that at which the air, which is held in suspension by the water, will begin to separate from the water, or that at which water vapor will form for the pressure and temperature, then the propeller will begin to "cavitate." In other words, the water will not flow into it as rapidly as it should to keep an unbroken stream, although the propeller will turn much more easily than if there were no cavitation. Air coming down into the propeller from the surface does the same thing and causes loss of thrust. The whole problem of high-speed propeller action is one of cavitation, for all high-speed propellers cavitate to a greater or lesser degree. Any tables or charts which I offer are subject to variation due to the difference in the amount of cavitation to be expected in different installations. The best that can be done is to try to hit an average case. Especially is this true of the higher speeds where even the location of a strut many feet in front of the propeller will have a marked influence on the propeller action.

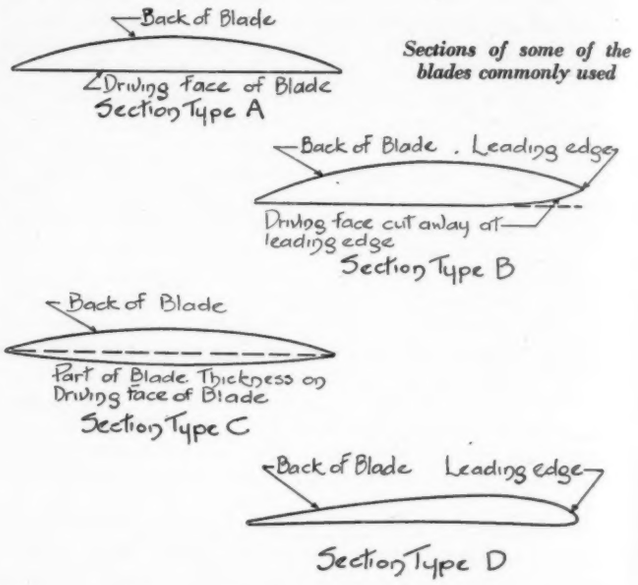
Before continuing, it is necessary to give some idea of the terms used in describing propellers. The diameter of a propeller is the diameter of a circle drawn around the tips of the blades. Anyone can tell the number of blades by looking at a propeller, and the blade area is the total area of all the blades. Blade shape is another detail which is evident to any one looking at the wheel, but the pitch is a thing which cannot be seen at a glance and as it is of the greatest importance in selecting a wheel and in checking its action, the pitch of a propeller must be defined.

Practically every propeller blade is a portion of a helical surface. To visualize such a surface imagine that a smooth sheet is laid down over the steps of a spiral stairway, eliminating the notches of the steps. That sheet would be the same sort of surface that we find on the propeller. It is steeper as we approach the inner rail and less steep toward the outside. But in going around the stair the amount of rise is always the same for the same amount of circular travel. When a complete circle has been made in going up the stairway, one has risen above the starting point a definite amount, which is the pitch of the surface. Pitch can thus be defined as the distance which the surface would progress along the shaft if it were continued until it had made a complete revolution around the shaft.

Since propeller blades must have thickness in order to have strength, only one surface of the blade has pitch in the sense given above. It is customary for the after face of the blade to be made to a true pitch and then the forward face to be shaped to go through the water easily and yet allow the material needed for resisting stresses to be put into the blade. Only in the last few years have we been aware of the vital importance of small changes in the shape of blade section. In a way, we knew that it had some influence in determining what a propeller would do, but did not realize that it was one of the major points in propeller design, just as the top of an airplane wing is as important to the performance of a plane as the lower part.

Half a dozen propellers of identical model and the same diameter and pitch were tried out on a Gold Cup boat. One propeller proved to be almost two miles an hour faster than any of the others. It was carefully measured for blade area, diameter and pitch, and checked with the others. Not until the shape of the back of the blades was investigated did the reason for the difference in performance become apparent. In grinding and polishing that particular wheel, a slightly different form was produced which had better characteristics for high speed work. After the reason for the superior performance was discovered, other wheels equally as good were easily made.

Right here it may be well to caution one to be skeptical about taking too much for granted the marked pitch of a propeller. Whenever you hear about a boat driving so easily that she has "no slip" you had better have the pitch of the propeller and the revolutions of the motor accurately checked, as well as the speed of the boat. And this holds for any unusual propeller result.


Back of Blade
Driving face of Blade
Section Type A
Back of Blade . Leading edge
Driving face cut away at leading edge
Section Type B
Back of Blade
Part of Blade Thickness on Driving face of Blade
Section Type C
Back of Blade Leading edge
Section Type D
Sections of some of the blades commonly used

In the sketches are shown some of the more commonly used blade sections. In the first one, marked "A," the after or driving face of the blade is a true helical surface and all the blade thickness is built up on this by curving the back of the blade. This usually approximates a circular arc with sharp edges. It is a good blade for general use, but often better results are obtained when the thickest part of the blade is nearer the leading edge.

Another not uncommon form is shown at "B." Here part of the thickness is put on over the helical surface and the rest of it on the back. In general, it is not as good as the first type, but a propeller of given diameter, pitch and blade area will turn up a little faster with that shape of section than it will when the first form is used. For use where the backing power of the boat must be very good, it is recommended as the type to be installed.

Some propeller designers like a section such as that shown at "C." This has very little to recommend it, for the only real effect is to increase the actual pitch of the wheel over that at which it is rated. It is to be found more often in the thick, heavy, cast-iron wheels used on commercial boats where the section near the hub is so blunt that it would choke up the flow of water through it unless relieved in this manner.

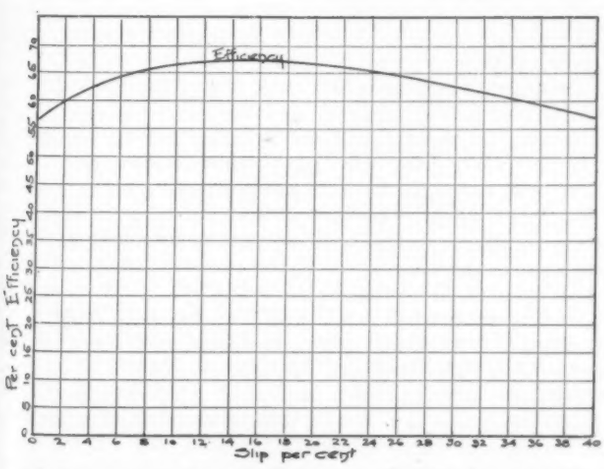
At "D" is shown a blade having a section somewhat like that of an airplane wing. Strange to say, this section does not work out at all at high speed, but has shown better results at low speeds on large vessels than any

other type. Efficiencies of more than 80 percent have been obtained in service with propellers of this type. When tried out on high-speed racing craft they have been utter failures. At high speed, cavitation is all important, and the thick, blunt leading edge simply throws the water right away from the rest of the blade and exaggerates all cavitational troubles.

Blade shapes vary according to the fancies of the propeller designer. You will find simple elliptical forms, fan shapes, gull wings and shark tails. Each one claims certain advantages for his particular form. Tests in the model testing basin at Washington show that there is no advantage in any of them over the simple elliptical shape. These tests were made under restricted conditions, I admit, and have never been carried out to the speeds or the revolutions which are met with in actual work. But if there is any real virtue in a particular blade shape it would seem that these careful tests would give some indication of it. Akimoff, the Russian mathematician, who has made an intensive study of propellers both for air and water, says that the blade shape does have a bearing on the excellence or failure of a propeller and he calculates the shape according to a most intricate formula. But his propellers did not work out satisfactorily on high-speed hulls, although they did marvelous work on large ships.

Some of the more widely used blade shapes are shown in the accompanying sketch. The elliptical form, either with wide or narrow blades and modified somewhat by the different makers, is the one which we see most often. At "B" is shown such a blade with that part of its form near the hub cut away to let the water flow through the wheel more readily. This has been used recently on some of the Gold Cup boats. It may be of interest to know that Purdy used this type on *Hotsy Totsy*, winner of the cup in 1930 and 1931.

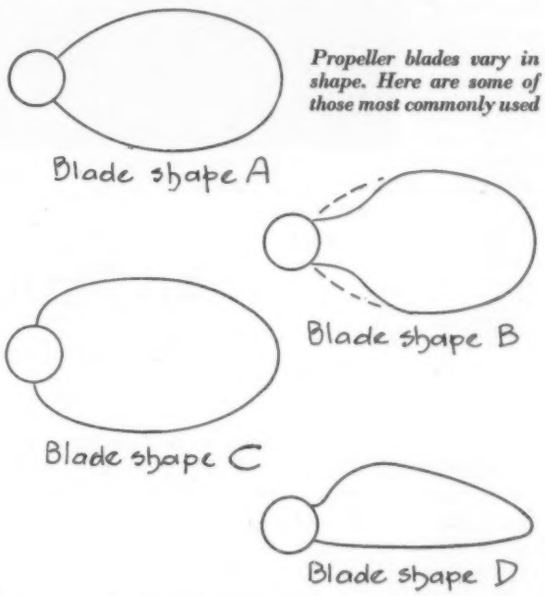
Exactly the opposite is the form shown at "C." This is more or less like the very wide, two-bladed wheel used on *Miss England II*. Certainly, if Purdy is right in cutting away that part of the blade near the hub, Cooper, who designed this odd wheel for *Miss England*, is all wrong — or *vice versa*. But there is another reason why Cooper may have used this peculiar form. Almost 4000 h.p. went into a little 14-inch wheel, and the stresses on the metal at the root of each blade must have been tremendous. In order to get a wheel which would stay in shape, he was forced to design one which had a strong section at the hub, or else the blades would be thrown off or twisted out of shape when the motors were opened up.



Efficiency curve of a three-bladed propeller, based on experiments made by Admiral D. W. Taylor

At "D" is a shape which is being used with success on many outboard racing motors. Somehow, it is a most pleasing shape and excellent results are being obtained with it. It is a question in my mind whether these fine performances are due to the shape of the blade or to the very fine workmanship and materials used in these wheels. I incline to the latter belief.

One thing which is of the greatest value in discussing propellers is a quantity called the pitch ratio. The pitch ratio of any propeller is obtained by dividing the pitch by the diameter. A 20-inch diameter propeller having a pitch of 30 inches, has a pitch ratio of 1.5. Pitch ratios have a decided bearing on propeller efficiency. The most efficient ratios are from 1.5 to 1.8, and no wheel should have a pitch ratio greater than 2.00 nor less than .6; in



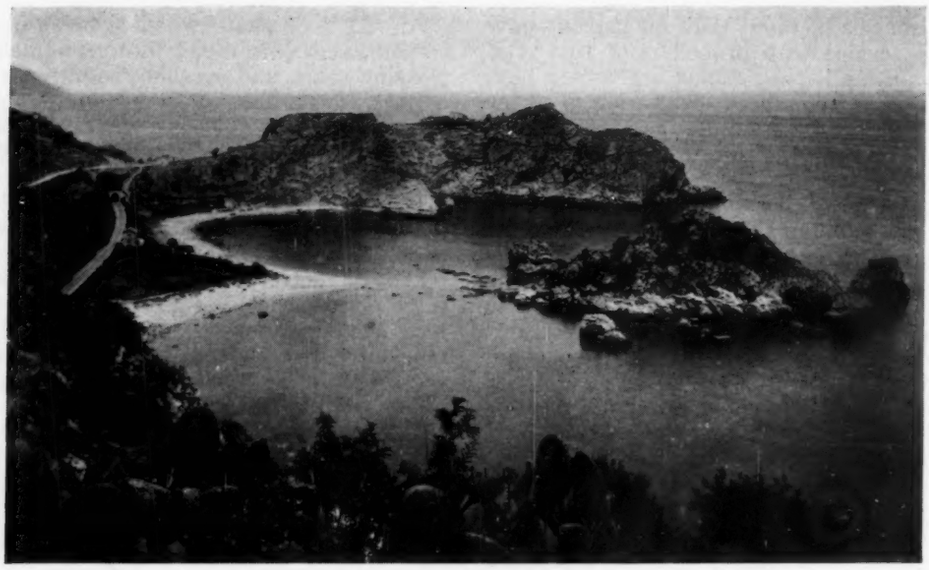
Propeller blades vary in shape. Here are some of those most commonly used

fact, most naval architects do not like to use pitch ratios of less than unity if it can be avoided. But the trend to high-speed motors in all types of boats has made it necessary to go to wheels of very low pitch ratio. They do produce some increase in speed because they permit the motor to turn up to its rated revolutions and develop its power, but they do not turn that additional power into efficient propulsion and the gain in speed is often made at an excessive cost in fuel. You doubtless know of many an auxiliary which makes almost the same speed with the throttle about half open as it does when it is fully open, and with far less consumption of fuel.

Although one cannot see the pitch ratio when looking at a wheel it does tell something about the wheel which can be seen. If two wheels of different diameter have the same pitch ratio, they will look exactly alike, only on a different scale.

From the way in which the pitch of a propeller is defined, it can be understood that if the face of the blade on which the pitch is measured were to cut through the water as if the water were a semi-solid, for one complete turn of the propeller it would move ahead in the line of its shaft an amount equal to the pitch. But the water is not a solid and the propeller does not go ahead like a bolt in a nut. Instead, it pushes some of the water astern. In fact, that is the only way that any thrust can be obtained when working in a fluid. The amount of advance which is always lost, is called the "slip" of the propeller. In order to make comparisons simple and easy, the slip

(*Continued on page 92*)



Along the rugged coast of Sicily, near the entrance to the Straits of Messina

An "Intrepid" Cruise

Part III—From Suez to New York

By ROY M. BARCAL

INTREPID anchored in Port Said for five days while her engine was again being overhauled, and then, on the afternoon of the 25th, we chugged out of the canal entrance and set sail for Crete, 400 miles away. Nothing about these waters indicated that we were in the warm, placid Mediterranean. In place of sarongs, we wore nearly all the warm clothing we possessed, although it was then the latter part of April.

Practically all of the way across to Crete we encountered head winds and it was not until early morning of the 29th that we sighted Scarpanto Island. Because the breeze was favorable we intended to go north of this island, but after sailing a short way the breeze hauled and came ahead, so we turned back and crossed to the south of it, thence past Kaxo Island where we were able to see the eastern end of Crete. At noon on the 30th Sadero, the northwestern point of Crete, was abeam, but as the wind was still dead ahead, we had to beat all along the shore of Crete, finally going in at Suda Bay on May 2nd.

We were soon ashore and during a drive visited Khania and other places of interest on the island. At eleven that night the anchor was weighed again. There was a dead calm and a glassy sea, so the engine was put to work. Along this coast we kept close to the mountainous shore, sometimes being only fifteen yards off the rocky cliffs towering hundreds of feet above us.

About nine the next morning we picked up our first favorable breeze and laid our course to pass between several islands and across the Gulfs of Lakonikos and Kalamata in southern Greece. While crossing the latter stretch of water, the wind increased considerably and before dark we were forced to take in our spinnaker. The breeze continued to increase and by midnight we were traveling at an amazing pace. In fact, it was obviously necessary to lower the mainsail, but it was blowing so hard and the seas were then so high that we dared not round up and take in the main. It was nearly two hours later before there was a lull. Picking the most opportune time, *Intrepid* was quickly rounded into the wind and the mainsail fortunately lowered before any damage was done. By this time we realized that we had been caught in a Sirocco, one of the worst of the Mediterranean winds. With only our staysail up we were making eight to nine knots.

During the second day of the Sirocco, through careless handling, *Intrepid* was allowed to deviate too far from her course and a tremendous wave swooped over her port quarter. It filled the cockpit, and solid water to the top of the cabin swept the whole length of the deck, plenty of it going below through the open companionway. The Ionian Sea was giving us quite a dusting. By midnight of the second day the wind and sea began to moderate and early the next morning we were again under full sail.

During the course of the Sirocco two small birds were blown aboard and stayed with us for two days. They became so friendly that they would perch on our hands and take food from our fingers and we grew so fond of them that someone was always ready to cuddle them to keep them warm. The second night they were carefully tucked under a blanket and appeared to settle down for the night but we found them the next morning stretched out lifeless on the ledge in the cabin.

On the afternoon of May 6th we sighted Cape Spartivento, the southern point of Italy, and by 8:30 had started up the Straits of Messina to meet strong head winds, an adverse tide, and such cold weather that, rather than face a freezing night, we worked under the lee of Cape del Arni to await daylight and a little warm sunshine. Next morning it was still necessary to beat up the Straits. However, we were rather glad of this, for it

gave us an opportunity to get a closer view of the mountainous shores of both Italy and Sicily as we beat back and forth. At a distance, Mt. Etna, snow-crowned and majestic, loomed against a clear sky, but we were not close enough to get a good view of Taormina. We could see small towns and villages along both coasts, and beautiful villas set in lovely gardens. At 3:00 P.M. we reached Messina where we decided to drop anchor and do the rest of the Straits by daylight the next day.

With the sun out and the tide with us, we left Messina early the next morning and cleared the Straits by 9:30 A.M. It was a beautiful day and the sea was a vivid blue, the Mediterranean as we expected to find it. By early evening we were off Stromboli but it belched no fire — only smoke.

North of the Straits, next day, as we continued our course up the west coast of Italy, bound for Naples, we saw a waterspout about a mile away, traveling away from us. Later we saw two more, but a light shower that night was all we got out of them.

The Island of Capri, renowned for its beauty and famous for its many grottos and San Michele, was in sight for hours the following forenoon before we finally passed between it and the mainland and found ourselves in the Bay of Naples. After viewing Capri one can understand why it was the favorite residence of Agustus and Tiberius. The towns of Sorrento and Castellamare appeared to starboard, then the great semi-circular shoreline of the Bay. Mt. Vesuvius, not hiding behind the usual cloud, was a magnificent sight pouring forth huge white clouds of smoke into a blue sky, the glow reflected from the crater on the smoke producing a soft shell-pink color. As we drew into the bay the Castel Sant' Elmo came into view, then the whole city of Naples — one of the most beautiful sights I have ever seen. By 3:30 *Intrepid* was in the mercantile port and was eventually moored in the Arsenal Basin, where she stayed for fifteen days.

At Naples some changes in the crew took place. Phillips was anxious to get back to the United States quickly, and he sailed at once for New York. Foster and Barclay, the European members of the ship's company, were both "fed up" with the trip by the time we reached Colombo, but, as they wanted to get to the Mediterranean they stayed with us until we reached Naples where they left us.

This left me rather shorthanded, but I was determined to go on with the cruise and planned to leave about May 23rd with the two Filipinos as crew.

Levick photos

"Intrepid" anchored in the Hudson River after completing her 13,000-mile voyage from Manila to New York in six months and 21 days. Standing on the after deck in the photograph above are the two Filipino boys who sailed the entire distance as crew

As time to leave drew near, I was kept busy provisioning the boat for the 1000-mile run to Gibraltar. The engine was not running too well, even though I had paid an engineering firm at Naples 250 lire just to look at it, and as Barclay, the engineer, was now gone, it was up to me to take a hand in the matter. Although I knew very little about engines, I had in mind what I had been told in Port Said about its being dirty, so I spent a whole day cleaning it thoroughly. I know now that this was all it needed, as it has run perfectly ever since.

The night before we left Naples I was fortunate enough to meet Otto Lange, formerly of Cleveland, who expressed a desire to finish the trip with me, with the result that he joined *Intrepid's* crew for the passage from Naples to New York. About noon on May 25th we started the engine to get out of Arsenal Basin and set our course to pass to the south of Sardinia on our way to Gibraltar. Lange proved to be a good sailor and for the first time since the cruise started I was able to go below and sleep with a feeling of absolute confidence in the sailing ability of the man at the tiller.

On the entire run from Naples to Sardinia we had calm weather and, although the distance was only 235 miles, we did not reach Cagliari until four in the morning of the 29th. We did not stop here long, but left that afternoon, again meeting very light breezes until we had cleared Cape Teulada, when we ran into a heavy northwest wind and sea. We bucked this for three days and then it ended rather peculiarly. The northwest wind developed into a very severe squall, then shifted to a heavy southeast squall before we had time to jibe and set up our backstay. This blew for about three-quarters of an hour and again shifted just as suddenly to the northeast, where it settled down, favorably for us, and we made fast time until we were off Cape de Gata on the southern coast of Spain. Once more we ran into very light weather during which we made very slow progress. On the night of the 5th of June we experienced an electrical storm that was as beautiful as it was awe-inspiring — the kind one occasionally sees on land and wonders what it would be like to be "at sea on a night like this." In the almost constant flashes of lightning we could see every steamer and boat for miles around, but one freighter coming up behind us apparently did not see us. As she drew dangerously near we were forced to alter our course and she missed us by some twenty yards.

We had little wind until we were off Malaga late the following night, but from there on we encountered a good stiff breeze dead ahead, as well as a fairly strong head current coming from the Straits of Gibraltar. While sailing close to the shore we ran into some shallow water which made the seas break badly and at times it seemed as though we were sailing right into the breakers. Not wishing to take any unnecessary risks, we started the engine so as to be sure we could come about quickly and not miss stays at a critical moment.

Castle dell'Ovo, an ancient fortress guarding Naples and the Bay

Once we got under the lee of Gibraltar it was smooth sailing and, taking advantage of this lee, we sailed at times as close as forty yards from shore. At 7:00 P.M. we were abreast Europa Point. Here the current was so strong that although we had a stiff breeze and the engine was running at full speed, it took four hours to round the point, a distance of about three miles.

Just before midnight of the 6th we dropped anchor in the harbor which, we discovered half an hour later, was restricted solely to the use of the British Navy, so up came our anchor. Another hour found us in a safe anchorage about a mile away, where we stayed until noon of the 9th. A very careful inspection was made of our standing and running rigging and we put stores and water aboard for the long Atlantic crossing ahead of us.

By noon of the 9th our anchor was on deck and, knowing how strong the current sets from the west through the Straits of Gibraltar, we planned to hug the Spanish side as far as Tarifa, whence we intended crossing over to the African side. However, all our plans and preparations were unnecessary for by two that afternoon the wind sprang up from the east and for the following seven hours blew about forty miles. The current being against the wind, the seas were very violent and at times *Intrepid* was almost unmanageable. Anxious to get through as quickly as possible, we carried full sail and the spinnaker, and were making more than ten knots through the water; it took a large passenger steamer, half a mile behind, four hours to pass us. We expected every moment to see the spinnaker blow out or the pole break, but luck was with us and by nine that night we were 25 miles down the African coast. Sixty miles in seven hours, twenty against a head current, was certainly far beyond our expectations.

We shaped our course, after passing Cape Spartel, for Las Palmas, on Grand Canary Island, 700 miles from Gibraltar. We had hoped to sail a straight course down this coast so as to sight Cape Blanco Light, but adverse winds forced us far to the west and we passed completely out of sight of land.

From noon of the 10th to noon of the 11th we had head winds and made but 75 miles. This was followed by a very poor 24 hours to noon of the 12th, when we made only forty miles, but from noon of the 13th to the 14th proved to be the banner day of the entire passage. With a stiff quartering wind, *Intrepid* made 170 nautical miles. Still sailing by dead reckoning, and not having sighted any land for five and a half days, we felt very gratified to find ourselves dead on the course as we passed Allegranza, the first of the Canary group. At four the following morning, the 16th, we anchored at La Luz, which is the harbor for Las Palmas.

Here we spent a full day filling our water tanks, getting extra supplies and going to Las Palmas for a bill of health from the American Consul, which is compulsory for entering a United States port. In the rush I nearly forgot to check my chronometer. From Manila to this point I had navigated *Intrepid* solely by dead reckoning, and without even a log, and I was sorely tempted to try and finish the trip in the same way. On the other hand, my knowledge of shooting the sun was only theoretical, having been acquired in odd moments of study, and I was equally anxious to see if I could really put it into practical use. So the decision was made to navigate *Intrepid* the rest of the way solely by the sun.

Down in the Trades between Las Palmas and New York "Intrepid" jibed, splitting her boom, which is being spliced

Starting at 8:00 A.M. on the 17th we stood down the shore, and with a strong breeze astern made the 32 miles to the southern end of the island by noon. From this point we headed *Intrepid* west by south on her last and longest leg, 3,700 miles.

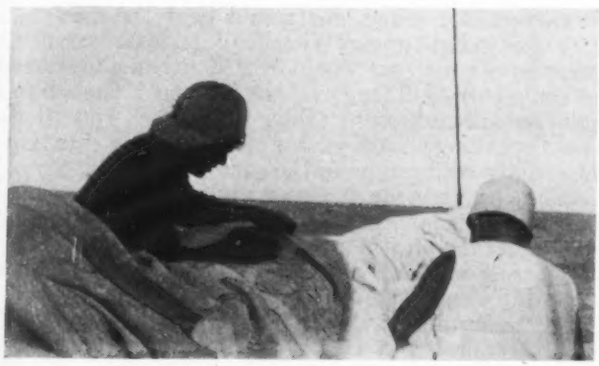
Everything went smoothly until 2:00 A.M. of the 21st. We were about 400 miles from the Canary Islands, running before a 35-mile breeze with full sail and spinnaker set. One of the Filipino boys, who could sleep at any time or any place, must have gotten a little too sleepy and jibed, full to full. The solid six-inch boom broke where it hit the backstay. It was useless to try to do anything about it that night, so we got our mainsail down and sailed with spinnaker and jib until daybreak. Lange, who had had a similar experience once before, took charge of fishing the boom and certainly made a good job of it for, later, we went through plenty of heavy winds and squalls and still it brought us all the way to New York without our having to touch it again. The splice was made as short as possible but, even at that, we had to carry one reef in the mainsail. To make matters worse, two days later the same Filipino jibed

again, with a resultant break in our spinnaker pole. We managed to splice this without any difficulty but we did not have the proper wood to make a new pair of jaws; consequently we had to lash the inboard end to the mast. Although it was two feet shorter, we had no trouble in keeping the spinnaker drawing properly.

Even though we had good, fair trade winds from a little north of east we got a bad side roll out of the north. Our boom was topped up as far as possible, yet it was continually tripping in the water, and even our spinnaker pole would touch the water time and time again. It became so bad that, finally, we had to put on a preventer stay to keep the boom out.

We sailed west between Latitudes 24 and 25 North, which, according to the pilot chart, seemed to be the most favorable position. We kept in this latitude until June 30th when the wind began to veer a little to the south. Thinking it might stay there only a short time, and not wanting to take the trouble to unlash our spinnaker pole and jibe over, we were gradually forced to go a little farther north until we got as far as Latitude 27. Here the trade winds began to grow very light, so we finally jibed over and worked back to Latitude 25° 30′, where we again found fresher breezes.

By now our mainsail was pretty well "shot" and needed almost constant repairing. In fact, there were very few days on the entire passage across that we did not have to lower it during the day and give it a patch or two. It was the only one we had and we could not afford to take a chance on losing it entirely.



Sails were repeatedly lowered for repairs in the Trades

At daybreak of July 5th we sighted something dead ahead which, at first, we took to be a small boat. But as the light grew stronger and we drew closer it proved to be a large red whistling buoy adrift. We sailed within a few feet of it but it was so covered with moss and slime that no numbers or identifying marks were to be seen.

That night marked the beginning of our first bad weather and our first heavy rain which, to Juan and Guadencio, was evidently heavenly manna, for they got up, stripped off their clothes, washed them, took a bath in rain water and made a regular gala night of it. The next day we ran into some very heavy squalls and, as the barometer fell considerably, we thought it possible that a small hurricane might be making up to the southwest of us. The squalls and rain lasted for three or four days but it finally cleared up again and we had comfortable sailing.

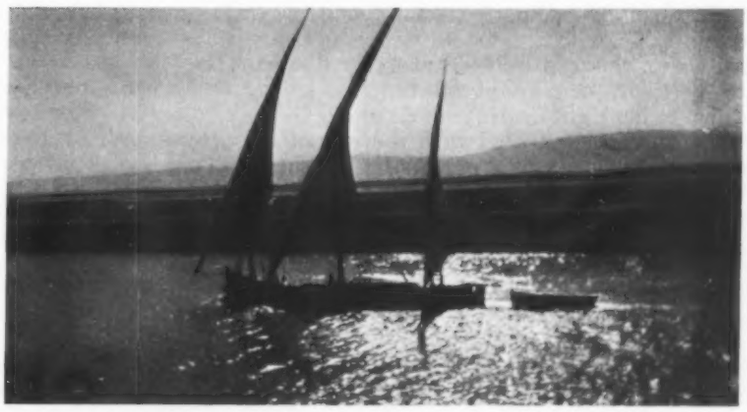
On the 9th we sighted the first steamer we had seen and judged her to be on a course from New York to South America, fairly well east of Bermuda. By noon of the 11th we had reached Longitude 66 West, and changed our course more to the north, intending to pick up Cape Hatteras. As we gradually worked north the wind became lighter and we were barely able to keep steerageway at times.

A Norwegian freighter, the *Vaarli*, coming up from the south, came miles out of her way just to have a look at us. After a month at sea the sight of a ship near enough to wave greetings was certainly a cheering event. How we wished for a wireless to get in closer touch with her! That afternoon, although we knew we must be passing into the Gulf Stream, we failed to find any signs of a difference in the temperature of the water, which we had supposed would be plainly discernible.

In the early morning of July 17th we experienced a severe squall, after which the wind dropped completely. Because of heavy rolling seas we had to take in our mainsail, and about 9:00 A.M. the seas became so bad that *Intrepid*, with sails down, rolled her decks under and we finally had to start the engine to keep her out of the trough.

In crossing the Gulf Stream we allowed for a 70-mile northerly set which turned out to be too much, for, at 7:00 P.M. of the 17th we picked up Cape Hatteras Light and found we were ten miles south of our plotted position. Early the following morning we passed Wimble Shoal Light and whistling buoy. All morning the wind was extremely light and by noon it was entirely gone. This was the hottest, most sweltering day we had experienced on the whole passage. Late in the afternoon we got enough breeze to move us on our way. Heavy clouds over the land indicated more rain and squalls.

By noon the following day we were past Cape Henry and headed up Chesapeake Bay for Old Point Comfort. We had not gone far when we were hailed by the Coast Guard who decided to come aboard and give us the "once-over." We kept on our course, expecting him to come alongside easily, but after two attempts he got too close and struck us, damaging our dinghy which was lashed on deck and protruded slightly beyond the rail. Fortunately, we had nothing aboard which was of interest to the Coast Guard, and at five that afternoon, the 19th, we rounded Old Point Comfort and tied up alongside the quarantine ship where we were duly inspected and passed. Thirty-three days from Las Palmas



An Arab dhow plowing picturesquely through the Suez Canal

(*Continued on page 104*)

Yachtsmen vs. Fishermen

By WILLIAM H. TAYLOR

STAND by for squalls. The old fisherman-yachtsman controversy is on again. A reader who signs himself "Belle Isle" writes in from Montreal to uphold the honor of the salt-encrusted halibut killers against the slurs of soft-handed yachtsmen, which he thought he saw in my recent yarn in YACHTING about the fishermen's championship series off Halifax last autumn. His letter follows:

"I have just read Mr. Taylor's article on the fishermen's races, and Mr. Hoyt's comments on ocean racing.

"Mr. Taylor says, 'The fishermen may not be so scientific and their vessels may not be on a plane with America's Cup contestants for speed.'

"I mention, before the argument begins, something which I hesitate to put on paper, that my father was a skilful sailor and boatbuilder by trade. He used to run the H. B. Company's supply ship or schooner between Quebec and the Labrador Coast. He claimed that on one occasion when it was blowing a gale of wind he covered one hundred miles in six hours, and could pass anything he met with sails on it.

"Mr. Taylor admits that the *Thebaud* at times logged 15 knots on her way down to Halifax. This is better than the *Vigilant's* speed when on that memorable occasion she saved the day by a few seconds.

"The general impression among yachtsmen seems to be that it requires more science or skill to sail a boat in light and variable winds on a fine day than when it is blowing a gale. Apparently, their standard of seamanship is not the same as that of deep sea sailors.

"What is a skilful helmsman? He must be a skilful sailor and all that that comprehends. His nautical education usually begins from childhood, as to leebowing current, etc., and he must know how to trim his boat and sails, and this can only be properly done by the 'feel' of the tiller, for a yacht will only sail at her best when down to her right bearings and be so delicately balanced that she can be steered with the tips of the fingers, or else the rudder, instead of assisting the keel, will act like a brake. He may have the same experience, intelligence and keen judgment, but if he has a hard hand he is no good at all for racing.

"And as for the scientific part of it. No doubt some enthusiastic amateurs may reach this high estate and are seamen in the best sense of the word, but I don't think they are any better than the best professionals, or that it requires any more science to sail a yacht around a race course than it does for coasting or steering a toboggan down hill."

Now, let's get this straight. I, and most yachtsmen, agree with many of "Belle Isle's" points. Personally, I am more of a fisherman than a yachtsman by nature, hope and inclination, and the farthest thing from my thoughts in that story was to tread on the toes of any Gloucester or Lunenburg rubber boots. Let's analyze this letter.

A hundred miles in six hours is pretty close to the all-weights sailing ship record for the best of the clippers, and considerable traveling for a Hudson Bay supply vessel. But the tide runs pretty strong along that coast, and no doubt she did it. I'd like to have been aboard, with my boots nailed to the deck.

When the *Thebaud* was logging fifteen knots she had the most favorable conditions for a heavy schooner — a reaching breeze and all the sail she dared lug. Under similar conditions a typical Alden or other ocean racing schooner of the *Thebaud's* length would probably have done as well or better. On rare occasions, under somewhat similar conditions, the America's Cup boats have gone as fast, though they are smaller, which makes their speed-to-length ratio greater. But admitting that a fisherman, under such conditions, is as fast as a yacht, how often do you get such conditions?

The average ocean racing yacht of equal size is infinitely handier to sail than the average fisherman, as rigged, and she would gain two or three minutes on every tack — maybe five or ten — just in coming about. With her smoother bottom, her lighter weight made possible by outside ballast, and her light sails, which fishermen never carry, she would beat the fisherman every time in light going. With her outside ballast, other things being equal, she would be stiffer than a fisherman and could carry sail longer, if the gear held, though this might not make her any faster under such conditions.

I am speaking now of yachts of the ocean racing type. The strictly racing type of the same size would, beyond question, be very much faster under moderate conditions, but their racing gear, not being built for it, would never stand the kind of a beating the *Thebaud* took that night across the Gulf of Maine, so there is no point in comparing them.

The "scientific" business I referred to meant such things as duralumin masts, strain gauges, *Enterprise* booms, wire running rigging set up with winches, navigators whose sole job it is to keep track of position, mark and weather every second during a race, card indexes of sails and their performances, and all those purely racing refinements. No fisherman ever had these, nor does a fisherman want them, any more than the average yachtsman wants them, except for pure speed.

A fisherman's business is catching fish. Racing is entirely secondary. No one will question that if a fisherman like Angus Walters, Ben Pine, John Matheson, Marty Welch, or a score of others applied the same amount of time, thought and money to the sole business of getting speed out of a vessel they could do it at least as well as the best yachtsmen.

But your fisherman's chief interest is in making as many safe and profitable trips as he can. He likes to race, and to win races. But the yachtsman whose chief interest is in racing is almost as much better at racing as the professional fisherman is better at fishing than the yachtsman who occasionally goes fishing. And for the same reason.

The fisherman, to live and succeed in his business, must be the finest kind of seaman. Too often seamanship is confused with racing skill, when as a matter of fact they are only slightly related. According to the fisherman's standards, many a successful yachtsman in the specialized field of racing is a rotten seaman. The reason so many fishing vessels are lost annually as compared to

(*Continued on page 92*)

W. B. Jackson

"Mahdee" was the first small yacht to try electric drive for auxiliary power

"Mahdee"

The First Small Electric Drive Auxiliary

By A. W. MOFFAT

MAHDEE was launched in April, of last year. In order to allow ample time for the development of plans and their unhurried contemplation I had gone to Sam Crocker with my ideas in February, 1930. Six months is a short enough time at best to do justice to every detail of a completed design. Crocker is a thorough, scientific workman with great experience in designing cruising craft. He works alone. There are certain enterprises in which it is more fun to deal with an individual than with an organization; and this was one of them.

The keel was laid in September, 1930, at the yard of G. F. Lawson & Son, Dorchester, Massachusetts, under a cost plus contract which called for delivery on April 1st. As Lawson had built two other yachts for me I knew from experience the quality of his workmanship and of his knowledge of seasoned material. With *Mahdee* we did not have to hurry. Coöperation between owner, architect and builder together, with plenty of time to decide details, was bound to produce a well-designed, well-built ship. We adhered to the three mottos which anyone building a boat should swear faithfully to follow: The best is none too good; the most expensive is generally the cheapest in the end; "If you are going to sea and going in safety you've got to be particular."

"Mahdee" has a sunken deck forward and is flush from rail to rail amidships

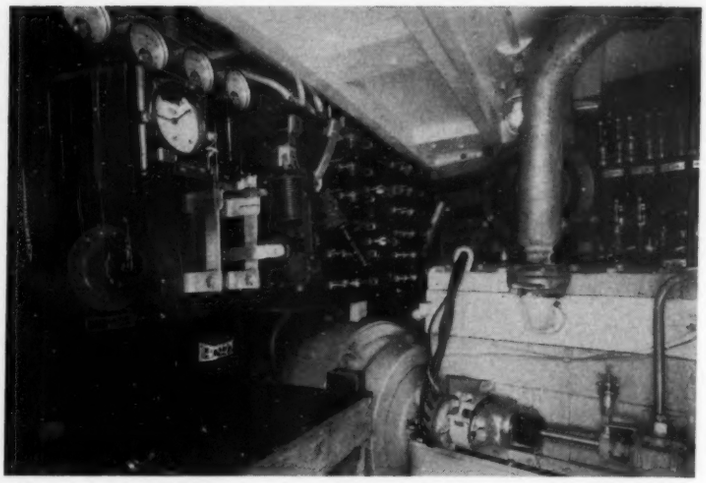
Mahdee has been successful. She has more than met the expectations of her owner who had definite ideas about what he wanted. To those who judge the desirability of a yacht in terms of speed, she is an enigma, and to those hardy Vikings who have an inferiority complex about power gadgets she is a horror. Departing from orthodoxy in layout, rig and power plant, she has attracted a great deal of attention, yet probably there was never a hull of more time-tried form. A little more depth would make her a regular Brixham trawler.

Anyone building a boat must be honest with himself as to the actual use to which he is going to put her if she is to be best adapted to that use. Some yachtsmen who never get time to go to sea build themselves seagoing vessels in which much comfort has been sacrificed. I knew from bitter experience that I should never be able to use *Mahdee* for more than a couple of short cruises each summer and the other ninety percent of the time she would be used as an intermittent family dwelling, leaving the mooring only on Saturdays and Sundays, half the time under power alone. Accordingly, I wanted *Mahdee*

planned, in every respect, to meet the needs of these actual, if unromantic conditions.

The three factors which from my point of view meant the most were *safety*, *comfort* and *silence*.

Safety lies first and foremost in the integrity and experience of both the naval architect and the builder in turning out a ship which, if properly handled, will be safe under any weather conditions likely to be encountered in the waters in which she will be used. Next in importance comes adequate protection against fire. There are too many factors contributing to safety to enumerate them all, but two more are worthy of mention because they are so often given almost no attention: one is the ability to lay hove to promptly and surely; the other is a rig that enables sail to be shortened rapidly without bringing the vessel into the wind or losing steerageway. Not many Marconi mainsails on tracks will come down freely unless in the eye of the wind. It is almost unnecessary to mention, as a major contribution to safety, good ground tackle with adequate means for handling.



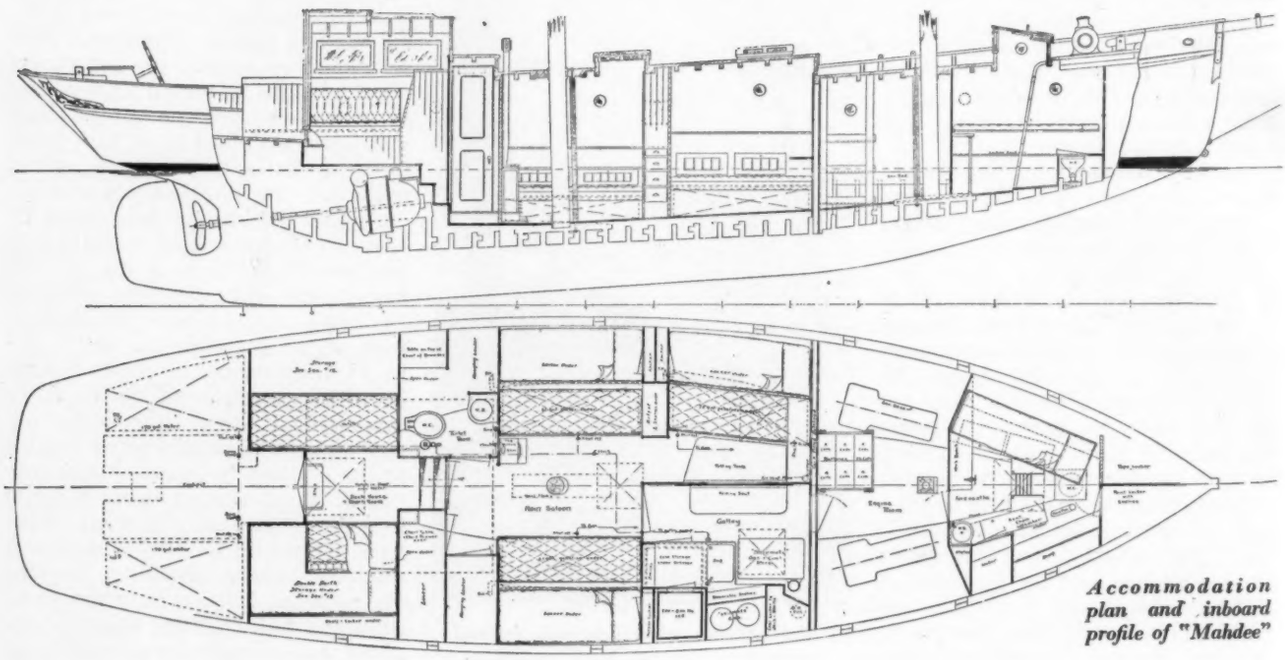
One of the two Winton 10 kw. generator plants, located forward, and the switchboard

Comfort means spaciousness for the number of people berthed aboard, whether lounging, eating or working; it means adequate ventilation at anchor and on any point of sailing, both for living quarters and bilges; ample headroom; a place for everything. But beyond all else, I think, it means the ability to stand up to a moderate angle of heel.

Silence means freedom from mechanical or vibratory noises when under power, and an exhaust so silenced that it is not necessary to shut it off in order to listen for sound signals in a fog.

Economy in first cost defeats its own end. If you cannot build the best of the size you contemplate, build smaller. Economy of operation is another matter — one to which considerable thought was given in developing *Mahdee*. It was necessary to plan a craft which would berth ten in the owner's party and could be handled under power by one man under any conditions; could be kept in first class shape both above and below deck by the same man, and be handled under sail by him and the owner together.

The length over all was determined by developing a handsome profile from the first fixed factor, 6′ 4″ headroom under a flush deck. The length thus determined, after minor changes in working out the design, proved to be 53′ 2¾″. The next fixed factor was 6′ draft. The beam and water line length were to be whatever they worked out in modeling a plumb stem hull of great stability with a long straight keel, for easy holding of a course and for the obvious advantages when hove to. The weights of the various units of the power installation were greater than with the usual auxiliary installation, and to some extent affected the design of the hull. The beam worked out to 15′ and the load water line to 45′ 11″. Tonnage measurements were 29 gross, 19 net; displacement 58,000 pounds. The principal weights were as follows: Two 10 kw. Winton generator plants, each, 1350 lbs.; one General Electric motor for propulsion, 2500 lbs.; Exide storage batteries, 1100 lbs.; switchboard, resistors, controller, service motors lead covered cables, 1000 lbs.; outside lead ballast, 16,000 lbs.; inside lead ballast, 4000 lbs.; launch on davits,



Accommodation plan and inboard profile of "Mahdee"

600 lbs.; ground tackle, two anchors and chain, 750 lbs.; electric windlass, 500 lbs.

The cost of the power units was high, as is always to be expected in a pioneer layout. The purchase price of all the units together was approximately $7500, and the cost of labor and material for wiring $1700 additional. In every instance the very best was selected. I believe a satisfactory electric drive of the same power could be installed for half the sum.

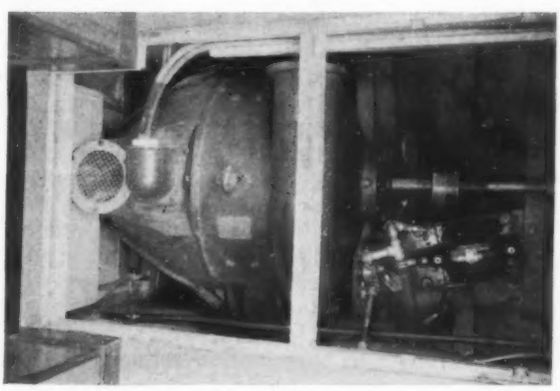
The chief reason for adopting the electric drive is in arrangement of accommodations. The electric motor installed as far aft as possible is clean, odorless, vibrationless, and absolutely silent. It requires lubrication only once a season and otherwise does not need to be looked at. Consequently, the living accommodations can be located all around it, with provision for accessibility. The generator units and batteries can be placed in the most practical location with reference to the particular layout in mind. The controller, of course, is placed near the wheel. You have absolute control of the vessel because the motor is always direct-connected to the propeller and has equal speed ahead or reverse. *Mahdee* started with a solid three-bladed wheel but now has a two-bladed feathering wheel which improves the speed somewhat under sail, as anticipated.

On a 16-hour run under power alone with two generators turning 1350 r.p.m. and the propeller (28″ x 18″) at 600 r.p.m. the average speed was 7.6 knots; fuel consumption, 4½ gallons of gasoline per hour. With a single generator running, which delivers 110 volts to the 220-volt motor, the speed was 5.7 knots. With fully charged batteries the speed under batteries alone is 5.7 knots for a few minutes, but for practical purposes about 3 knots for an hour's run. An ampere hour meter tells at a glance how much is left in the batteries at all times.

This installation gives three independent sources of power, each generator, or the batteries. The batteries may be charged by either generator and the lights may be run from generator or batteries. Normally, the batteries float on the line exactly like an automobile starting battery.

No electrical knowledge is required to successfully operate an electric drive installation. The instruction book prepared by R. J. Ruedy of the General Electric Company is a masterpiece of simplicity. Anyone who can read the plates on the switchboard has only himself to blame if he goes wrong.

In *Mahdee* the driving motor is located beneath the floor of the sunken deckhouse. The engine room is the full width of the ship abaft the foremast, which keeps the weights well back from the bow. This room is separated from the living quarters by a 4-inch felt-filled bulkhead where the flush deck becomes the forward well deck, as shown in the photograph. It is separated from the forecastle by a partition. This is the only space in the ship which has not full headroom. An ice box type door leads from the engine room into the galley, which occupies the starboard half of the ship amidships for a length of eight feet, separated from a double stateroom on the port side by a partition in which there are sliding panels. A big comfortable transom and a drop leaf table on the partition transform this stateroom into a bar parlor, or a dining room for four, to which things may be passed directly from the galley.



The G. E. motor for propulsion, located under the floor of the deckhouse

All the cooking aboard *Mahdee* is done by members of the family. The cook can work without feeling isolated from the people in the main cabin or in the bar parlor. Nor is the galley a hot place to work. The break in the deck at the forward end of the flush deck provides space for four ports across the forward end of the galley and bar parlor. There are two on the sides. All are Gust ports, made by Gustafson of South Braintree. They operate like the breech of a gun, by the touch of a lever which operates a cam. They can not only be locked shut in an instant, but can be locked open for ventilation. The screens need not be removed in closing the port. They never leak, and as the pressure is applied at four points in locking, the glass does not crack. For further ventilation there are three skylights over the galley, the bar parlor and over the main cabin. The high coamings over which these are set are square so that the skylights may be placed to open either fore and aft or 'thwartships, a great advantage in securing maximum ventilation. The galley is further cooled by having the smoke pipe from the coal range set within a larger pipe from the deck up, with the Liverpool head fitted to the outer pipe. Thus the smell of cooking is drawn out by the draft of the stove.

The cockpit, and the controller, alongside the wheel

By daytime the deckhouse is a chartroom and a lounging place; by night the starboard upholstered seat folds neatly away to reveal a full-sized double berth underneath. On the opposite side the transom seat is seven feet long, extending, like the double berth, under a deck which is carried three feet abaft the deckhouse. Under this seat is an enormous and very accessible sail locker, and beneath the floor of the deckhouse, in

(*Conitnued on page 100*)

The Outlook for the Outboards

By GEORGE W. SUTTON, JR.

ECENTLY we made the suggestion in YACHTING that some of the European champion outboard drivers be invited to this country to take part in some of our regular regattas and, possibly, some special "world championship" races. This met with great enthusiasm in Europe and has borne fruit much earlier than expected. It is announced that Charles H. Harrison, the outstanding professional British champion, whose recent speed of 55.33 miles an hour will become a world's record in Class F when recognized by the International Motor Yachting Union, will come over here early in the Spring to drive in the Miami Beach Regatta, March 18th–19th, and probably in other events on the "grapefruit circuit." Harrison drives a light British-built hull named *Non Sequitur X*.

It is hoped also to get Philip J. Turner, an amateur, and second only to Harrison in British racing, to attend some of our races. He uses an Italian Mariella hull with the latest Class F Laros Italian engine.

One of the main attractions in our regattas next summer may be Aldo Dacco, the wonderful Italian driver who has held all foreign world's records until they were all beaten by American drivers recently. He suffered a serious accident in a trial run last summer and is almost entirely paralyzed in the right arm and hand but hopes to recover in time to join us next July or August.

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One of the most important revolutions ever staged in the motor boat world has just been engineered and executed in the amazing agreement signed by the Outboard Motors Corporation and the Johnson Motor Company. The engineer was James W. Mulroy, the sensible, hard-working, far-sighted secretary of the National Outboard Association. I hope he will not be executed, as are so many revolutionists.

The outboard makers have got religion. Every outboard driver, every regatta official and every marine writer knows that outboard racing has been full of abuses, most of them springing from the opportunities the sport has presented for domination by professionals. The following statement, coming from the National Outboard Association, shows the remarkable manner in which the leading manufacturers have undertaken to purge the sport from within, an effort which cannot fail to be a wonderful thing for outboard racing throughout the country:

"In a move conceded to be one of the most important ever taken for the benefit of power boat racing, officials of the Outboard Motors Corporation and the Johnson Motor Company have signed a pact designed to restrict their activities and the activities of their employees in outboard racing.

"The signing of the pact was prompted by a desire to accede to the requests of race drivers and motor dealers who want the manufacturers to refrain from direct or indirect participation in racing. These requests were transmitted by The National Outboard Association to officers of the two leading manufacturers with a strong plea in which the manufacturers were asked to help quell the charges that the motor builders were tainting the sport with commercialism.

"Charges with varying degrees of truth behind them have come from drivers, regatta officials and dealers during the 1931 boating season, to the effect that the manufacturer's influence was steadily mounting in the sport. It has been claimed that favored drivers were given or 'loaned' specially prepared motors for use in important races, that changes in racing motors were made too often and that, in some cases, certain drivers were indirectly receiving expense money.

"The manufacturers emphatically deny that their participation in the sport was ever carried out on the scale charged. However, they do admit that some of the more aggressive drivers have been insistent on getting special favors and that, in some cases, such drivers were successful in gaining their ends due to the manufacturer's desire to give the drivers the fullest service.

"It is believed that drivers and dealers throughout the country will herald the action taken in signing the pact to be visible evidence of the motor builders' good faith and the agreement should do much to assure the continued growth of the sport."

Following the National Outboard Championships, held last October, Secretary James W. Mulroy of the N. O. A., made a strong plea to D. V. Stratton, president of the Johnson Motor Company, and Ole Evinrude, president of the Outboard Motors Corporation, in favor of the signing of agreements which would guarantee to correct real and imaginary evils which were being blamed on the manufacturers. Outboard enthusiasts considered any such action unlikely because of the failure of such efforts in the past. However, the executives of the leading outboard motor companies met to see what could be done about it, and a pact drawn up by the manufacturers consisting of a number of agreements, which will go into effect at once. The agreements were signed in the presence of James W. Mulroy on December 29th. A summary of the pact follows:

"The manufacturers will not give or loan, directly or indirectly, any racing motors, parts, boats, accessories or other equipment to any racing driver, club, dealer or other factor in the racing sport, but will require payment in full for such products at the regular list prices.

"Further, the manufacturers will not permit any employee to participate in any race or regatta events, and will not contribute directly or indirectly toward the expenses or remuneration of any racing driver.

"They will not advertise in any publication or cause to be advertised or printed in any manner, the winning of any races or the establishment of any records by their products.

"The manufacturers will request the National Outboard Racing Commission and all boating associations to refrain from mentioning the name of the motor or of the manufacturer when reporting races and regattas and the establishment of new records, but to give full credit to the individual driver.

"They will limit the amount of service rendered at races or regattas and will advocate that all service be rendered through the local dealers. In no case will the manufacturer's representatives act as officials at regattas. They can, however, serve in the capacity of Inspector of Motors, if they are so requested by local officials.

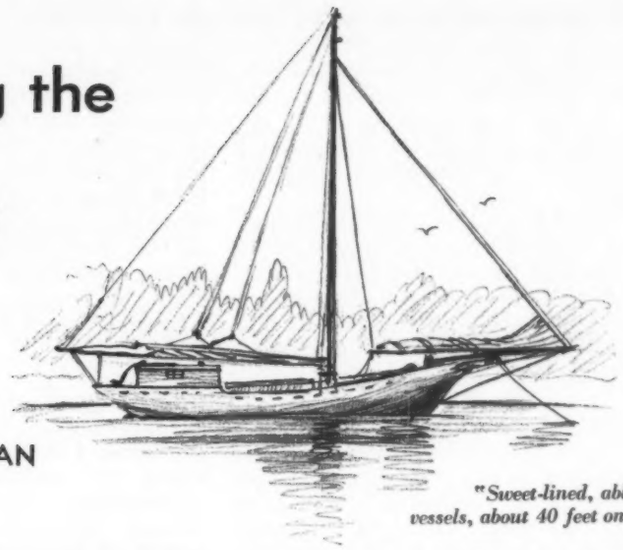
"Any part or accessory of a racing motor that is to be

(*Continued on page 102*)

Putting the House Aft

By

HAROLD A. CALAHAN



"Sweet-lined, able little vessels, about 40 feet on the deck"

WHEN I was a boy I spent my summers at New Suffolk, on Peconic Bay, at that time the center of the scallop industry. Whenever a strange yacht came into the harbor, it was an event, and everyone in the village came down to the shore to look the stranger over. The visiting yachts were in marked contrast to the local scallop fleet, and their outstanding distinguishing characteristic was the fact that the house was amidships just abaft the mast, while the house on the scallop boats was pushed aft, just forward of the rudder post. That was thirty years ago and most of the scallop boats were anywhere from twenty to fifty years old, so that I doubt if any of them are afloat today. Some of the oldest boats in the fleet boasted poop decks raised six to eight inches above the deck at the waist.

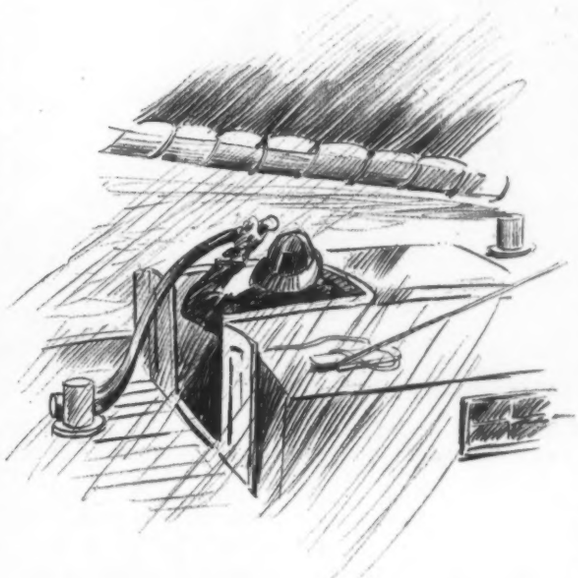
They were sweet-lined, able little vessels about 40 feet on the deck, with clipper bow, the inevitable gilded American eagle as a figurehead, and a long nose-pole shrouded and bob-stayed, and an immense jib. The jibs were often scandalized but never reefed. The jib swung on a fore and aft traveler. The masts were fidded for topmasts which were almost never carried.

I was scornful of the workboats in those days and my one ambition in life was to own a yacht with a cabin amidships and a generous cockpit. But now as I look back on it, the old workboats with the cabin aft had many advantages over the typical yacht.

The scallop fleet lay at anchor all summer. Occasionally an ambitious soul would detach himself from the crowd of wise crackers in Howard Tuttle's store, mosey down to his skiff, scull out to his vessel (sculling was the order of the day; no one ever rowed), get up sail, and cruise around the bay with a dredge overboard to see where the scallops were moving. The scallops were faithfully dumped overboard because summer was a closed season. Before dawn on the first of September, the entire fleet got underway and by noon the luckiest were back with a hold-full and a deck load of snapping, chattering shellfish. They sailed and dredged hard throughout fall, winter, and early spring, whenever the bay was sufficiently free from ice and it was not blowing too hard to knock down a boat almost anchored to the bottom with six to eight dredges.

As I look back on it now, it is evident that the boats were supremely well adapted to the work they had to do. They had big, broad decks with eight-inch bulwarks from which a man could handle a dredge without danger of going overboard. On either side of the immense centerboard trunk was a wide, deep hold, capable of carrying a tremendous cargo. With the hatches in place, an enormous deck load could be carried without in any way interfering with the working of the ship. And, best of all, was the small house located dead aft.

It must be borne in mind that these were boats for winter work; they were sailed in freezing weather, in blinding snowstorms, in rain and fog and chill. Whenever a skipper made a good strike and returned with a full load early in the day, the rest of the fleet would follow him the next day; so that he often sailed the night before under cover of darkness, to be on the ground by sun-up and gather the cream of the haul before the other boats discovered his whereabouts. That meant that the cabins were laid out with two berths and a small but highly efficient coal stove. The cabin was so close to the rudder post that the boat was steered with a long, curved tiller that ended directly above the companion hatch. In bad weather the skipper would stand in the cabin with the hatch-slide pushed halfway back and no part of his body exposed except his sou'westered head and mittened hand. All the rest of his body was protected



In freezing weather the skipper, with only his hand and sou'wester exposed through the companionway, was protected by the snug warmth of the cabin stove

by the snug warmth of the cabin with its glowing coal stove. In fair weather he could perch secure on the roof of the house, with his legs dangling down the companionway, and handle the boat in comfort; or he could handle the tiller with equal facility from the after deck. He could run forward and lend a hand at the dredges and get back to the helm without the necessity of climbing out of and into a cockpit.

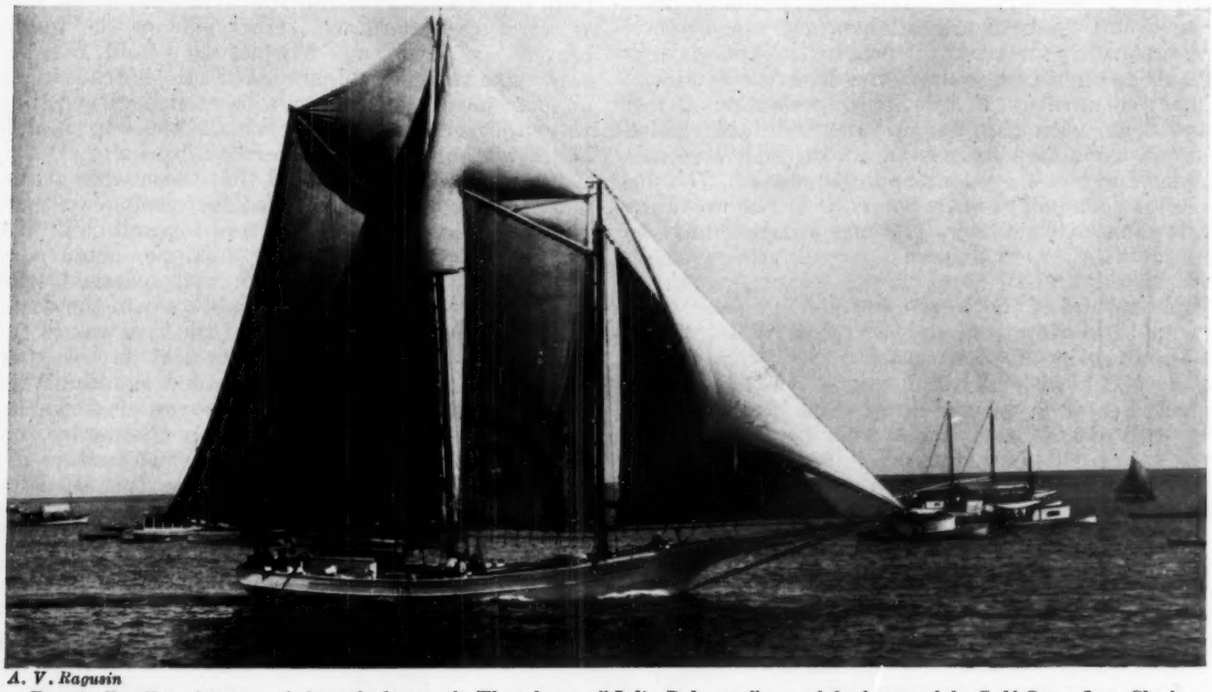
The halliards were belayed to a pin rail at the foot of the mast, but all other lines led to within easy reach of the helmsman — the sheet at his feet, the jib sheets to cleats on either side of the after deck, the centerboard pennant to a primitive jam cleat on the roof of the house. From his position at the helm, the skipper could see his whole ship because there was no forward house to hide his view.

Now it seems that the only real reason for building a house amidships is to gain greater headroom; but the old scallop boats managed to get headroom without spoiling the looks of their craft. The saddle for the jaws of the boom was just clear of the deck, yet the boom swung clear of a high house without being topped up excessively. If a house of this height were built amidships, the boom saddle would have to be three or four feet above the deck for the boom to clear it.

While living on Shinnecock Bay in 1913, I bought an 18-foot catboat for the enormous price of ten dollars. She was an open boat, and I wanted to cruise in her. If I built a house that would give me comfort there would have been so little cockpit left that it was not worth saving, so I followed the example of the old scallop boats and built the house over the entire cockpit clear back to the rudder post. Then I found myself in trouble. I thought it would be easy to pick up an old curved tiller, but the boats that had sported them in the early days on Peconic Bay were nowhere to be found on Shinnecock Bay. After much trouble, I found an old man who had been saving a curved piece of locust for many years with the idea that some day he would whittle it into a curved tiller. He gave me that piece of locust, and I whittled it down at one end, pushed it through the rudder post, and set sail. But the wood had rotted; it probably was not locust, after all, and it kept breaking and crumbling and giving me trouble. So at last I had the blacksmith make a heavy tiller of iron which served the purpose beautifully.

I cruised for six weeks in that leaky old boat, and trained myself to sleep with one hand over the side of my bunk so that when the water rising in the bilge wet my hand, I would get up to bail and go back to sleep again. The weather was unusually good in that long, single-handed cruise, but there was many a chilly night when I was thankful that I could handle the ship with only my head and hand protruding from the cabin hatch. I never missed the cockpit, and I utilized every inch of that boat.

It would seem as though modern yachtsmen might take a lesson from the old scallop fleet. We read of offshore cruisers and racers requiring weather cloths to protect the helmsman, and we know that even in midsummer a trick at the wheel offshore is a cold, wet job. Why not build the house where it will protect the most important man in the ship so that he can descend into the snug security of a cabin and work his ship in comfort?



A. V. Ragusin

Practically all working vessels have the house aft. The schooner "Julia Delacruz," one of the fastest of the Gulf Coast fleet. She is usually found at the line in the annual race for working boats off Biloxi, Miss.

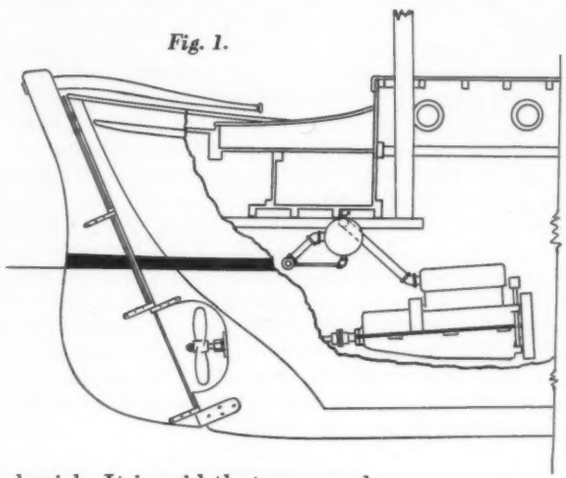
The Double Outlet Exhaust

By JOHN G. HANNA

IN A recent issue of YACHTING Mr. Burke Jenkins was kind enough to say some good words for a method of installing the exhaust pipe which he credited to me, as "an adaptation of a North Sea wrinkle." I am glad to accept the editor's invitation to explain this method for the benefit of all hands.

First, it is hardly correct to call this a North Sea wrinkle. I first observed it used in the motor lifeboats of the British Coast Guard, and these, of course, are not limited to the North Sea coast of Britain. In Board of Trade tests of these boats, they were, with the engine running, rolled completely over by means of a rope wrapped around the hull and pulled by a powerful hoisting derrick. It is said that even under such drastic conditions, in no case did water get into the engine, nor was the engine choked or slowed down by back pressure. These boats were double-enders, and the method seemed particularly applicable to such a hull.

Fig. 1.



My first use of it was at the suggestion of the owner, in the double-ended ketch *Golden Gain* which I designed for Capt. Vivian Hewitt, the English ornithologist and explorer, in 1922. The following year I made a similar installation in my own boat, a 28-foot double-ended hull, formerly a fisherman. In this I used the method shown in Fig. 2, but with a Thermex muffler, as in Fig. 1, attached at the top of the water-cooled exhaust riser, close under the bridge deck. In 1924 I designed the installation shown in profile in Fig. 1, and in plan in Fig. 1A, for the 36-foot double-ender *Carol* for Mr. E. L. Springer. The engine is installed in an engine room aft, and the exhaust goes first to a Thermex under the cockpit floor. All cooling water is taken by a hose (not shown in drawing) to the inlet on top of muffler, and from the bottom a drain pipe takes what water may not be vaporized to the exhaust outlet pipe running straight through the hull.

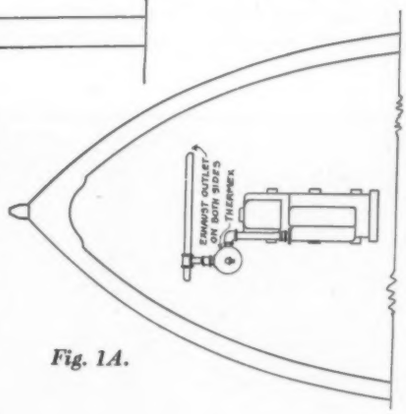


Fig. 1A.

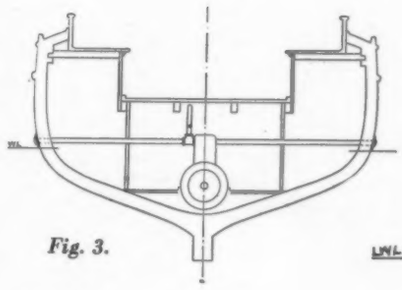


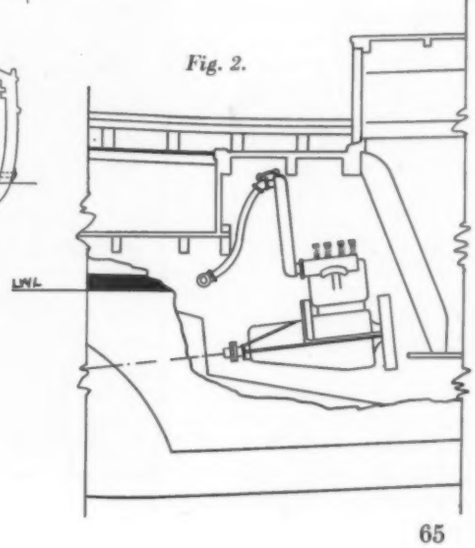
Fig. 3.

After the plans were completed, Mr. Springer decided to use a different engine, a heavy duty two-cylinder, and the arrangement had to be changed somewhat. However, another boat was built substantially to the same design, and using the engine shown (a 35 h.p. Kermath). This is owned by Mr. T. C. Briggs of Rochester, who, unintentionally, made a valuable contribution to knowledge of the subject. When his boat was driven to the limit, the outlets, normally a few inches above the water line, were submerged, and at this speed a bad pounding was evident. On the advice of one of these know-it-all boatbuilders, who asserted the submergence caused the knocking, he changed the system to an outlet high above the water line. There was absolutely no diminution in the knocking, thus proving it must have originated in some cause other than the exhaust system. In every installation of this kind the outlets should have deflector heads over them, pointed aft. Countless experiments during the last thirty years have shown that such deflector heads cause a decided suction when the boat is running, rather than any back pressure. Recently I have observed two Cummins Diesel engines operating faultlessly with submerged outlets and deflector heads.

A certain way to get into trouble is to take another favorite bit of advice of the inexperienced boatbuilder, and nail a leather flap valve, instead of a bronze deflector head, over these outlets. In the double outlet system there is no need to prevent water from entering the pipe as freely as it may, and in any system these leather flaps are sure to make a failure of the installation.

In these and other double-enders this system had proved so satisfactory that I saw no reason why it should not be equally good for square stern hulls, and have specified it for several of these. Fig. 2 shows the 27-foot cutter *Penguin*, designed for John Sewall. A water-cooled riser goes from the engine, a 10 h.p. Falcon, as far up as the bridge deck permits, and from this, exhaust hose leads down to the pipe running straight through the hull under the cockpit. All cooling water goes from

Fig. 2.



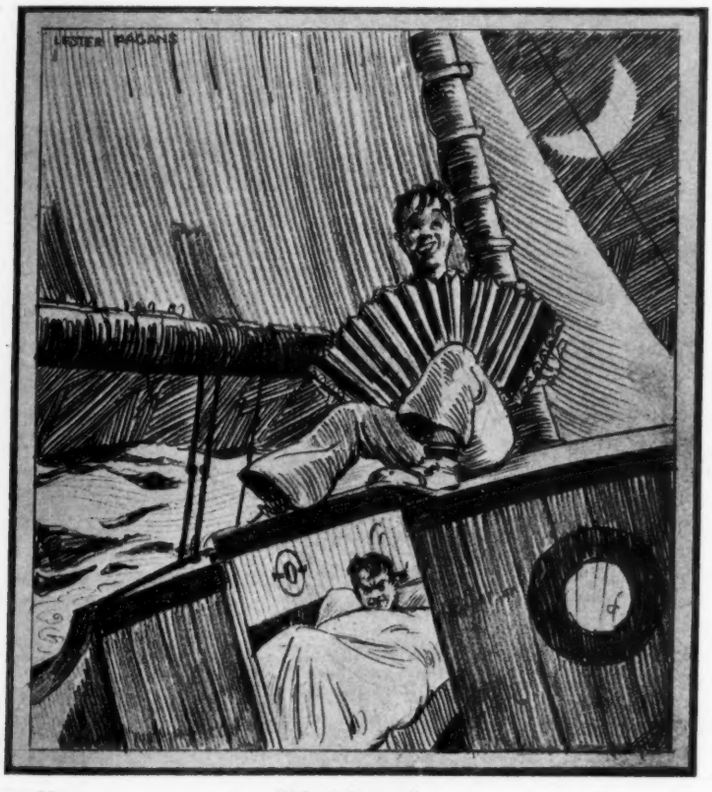
engine to bottom of riser jacket, by pipe not shown, and from the top of this jacket it is turned into the descending line. No muffler is included, for the reason that the exhaust is so much condensed in the water-cooled riser, and further condensed by the stream of water in the rest of the line, that it reaches the outlets with scarcely noticeable noise. Mr. Sewall reported the installation very satisfactory generally, except that when motoring with a large party in the cockpit of the little vessel, the outlets were both submerged, and he thought there was too much back pressure. Mr. Briggs's experience with *Vagabond* may throw some light on this.

Fig. 3 indicates that the method is adaptable to practically any form of hull. This shows the midship section of the little 25-foot, square stern ketch *Wyomi*, built for Mr. L. D. Huntington, Jr., and later owned by Mr. Frank Goodell of New York. The cockpit of this vessel is placed ahead of the mizzenmast, an arrangement gaining quite some favor on small ketches. The engine is installed under this cockpit. The pipe was taken up from the engine in a gooseneck bend and down to the tee in the athwartship pipe, without a water jacket at first, but experience showed a jacket was essential on the rising part, as it gets scorching hot without. Mr. D. A. Whitaker, who cruised nearly 2,000 miles in this little vessel, in winds varying from five inches to fifty miles per hour, reported the double outlets were most satisfactory. Incidentally, the 50-mile wind was going south against the Gulf Stream, where it goes north at its maximum velocity. Anyone who has been there knows what kind of sea that means.

It should be quite evident that any water slopping in one outlet is bound to run straight through the transverse pipe and out the lower end. It is absolutely essential to the success of this installation that the pipe be perfectly straight, with no bends, drops, or pockets in it. There would then be no conceivable way by which water can get into the engine. Whereas, water has been reported by any number of writers as getting into engines with even the most expertly devised stern outlets, when running before a bad following sea. And all stern installations have to have a drain cock, usually inaccessible without much profanity and skinned knuckles, at the lowest point of the exhaust pipe, where it passes under the cockpit, or perhaps under the floor of an after cabin.

One imaginary objection to this system always worries people who have had unpleasant experience with a *single* side outlet. They think exhaust gas will be blown over the boat. But such, in fact, is not the case. If both outlets are above water, the gas goes almost wholly out of the lee outlet, for the obvious reason that atmospheric pressure is less on the leeward side of the hull. And if the hull is heeled, so that one outlet is under water, the gas goes almost wholly through this submerged outlet, because of the strong suction produced by the deflector head. And if both outlets are submerged, naturally, there can be no blowback. Besides, the stern outlet as generally used does not prevent gas from blowing into the cockpit, as anyone knows who has ever traveled with a strong following breeze.

Another advantage that appeals to me is that the piping is simple, accessible, and visible, so that it may be watched for leaks, and easily replaced when necessary. It is usually much less expensive than the complicated plumber's nightmare of deviously bent and jointed pipe that is so often required to get around or under various obstructions to the stern outlet. On the basis of the long and varied experience here recorded, and including numerous other boats it is needless to describe, I unreservedly recommend the double outlet system, particularly for sailing craft.



The night watch

Rudders

The Evolution of their Design and Placement in Fast Motor Boats

+ + +

By HENRY CLAY FOSTER

THE mysteries of marine propulsion are favorite subjects for profound debate in the rocking chair contingent of every boat and yacht club in the land. Why does a boat act thus and so when you'd expect her to do so-and-so? There are still those experts who declare that this habit of going contrary to expectation is inherent in all things of female classification. They will even wax historical and trace for you the ancient designation of a boat as "she" back to the Phoenicians, though whether it is history or hokum that is expounded does not matter.

As power-driven craft have increased in speed in the last few years, many points involved in the complex process of the motion of this type of boat have been magnified. Though of minor influence at slower speeds, some of these factors have assumed great importance, at times even determining the success of a high-speed boat in competition.

Scientific study and endless experimentation by naval architects in perfecting racing craft to contend for important trophies is gradually giving us additional data on many formerly mysterious causes as to the actions of motor boats. Each discovery, however, is usually kept a secret as long as possible because basic patents cannot be obtained, and the discoverer or inventor, as you please to call him, has a right to all the advantage he can get out of it. However, in most cases, alteration of other factors call for further experimentation. And so it goes.

The rudder, apparently, is one thing which many students of marine propulsion tend to regard as of small importance save that one of the proper size and strength for turning the boat must be installed. Few persons are willing to recognize that in high-speed craft there are other aspects of rudder design, construction, position, etc., in relation to the general problems which account for peculiarities, good and bad, in the behavior of a given boat.

As a matter of fact, the action of water about the shaft, strut, propeller, and rudder beneath the after stations of the boat require keen engineering investigation — if maximum efficiency is the object desired. And other things being equal, this is a major point with all boats as long as vital safety factors are not sacrificed or too greatly abridged.

The possible positions of the rudder are, of course, abaft the stern transom, immediately forward of the stern transom, and the "bow" locations. Time was when most boats had outboard rudders. They — the rudders — were easy to install, and it was argued that if such a rudder were torn off, there was little damage to the hull itself and it could be easily and cheaply replaced. Engineers then believed the outboard rudder to be more efficient than one of the same blade area located immediately forward of the transom. They reasoned on the principle of the lever — that the farther the rudder from the point of the boat's turning, the more effective it should be. But, as is often the case, a qualifying factor was overlooked. The outboard rudder allows the water to escape over it on a turn. How often did we see a runabout throw a "rooster's tail" of spray on a turn? To prevent this a fast boat would have to resort to a horizontal flange carrying out the line of the bottom aft, similar to the cavitation plate on an outboard boat, although, as far as we know, this device has never been used and is not likely to be.

The rudder located immediately forward of the transom is more efficient because the bottom of the boat above it keeps the water from escaping over it when turning. There is no "rooster's tail," and the boat "does her stuff" without the flying spray aft which needs only a brisk wind from the right direction to drench the passengers on a short, full turn.

Opponents of the outboard or after transom rudder also declare that in its exposed position it is more likely to suffer damage; that the usual rig either requires holes in the transom (which can prove dangerous under certain conditions) or a moving quadrant on the after deck, which is annoying and likely to be injured sooner or later. And finally, they say — and cannot be denied — that an outboard rudder on a power boat, especially a runabout or small, neat cruiser, detracts from the trim stern transom line. On the other hand, it is admitted that the rudder post, extending through the bottom with a rudder forward of the transom, makes another stuffing box to attend to, and adds to the dangers of leaks through or about it. And this is true, too.

The action of any after rudder is, obviously, to push the stern to one side and thus off the line of travel, swinging the bow to the other side and into the desired direction. As a fast boat goes into a turn the pressure against the rudder causes her to heel inward or "bank." The deeper the rudder the greater the banking — on the first part of the turn. The stern then slides outward and water begins to flow diagonally across the bottom from the outside toward the inside of the turn. This cross-flow causes a kind of transverse "squat" by building up a pressure, or lift, on the hull toward the outside of the curve, and a suction on the other side — toward the inside of the turn.

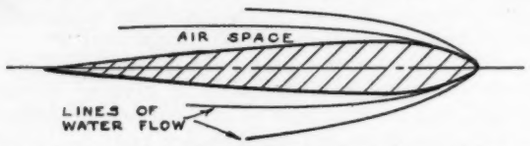
This increases the bank, although the pressure against the rudder blade — which started the banking — may now be easing up as she obeys the wheel. As the boat gets into the small radius of the curve centrifugal force, which acts through the boat's center of gravity (well above the water line), tends to make her heel outward. If this force overcomes the banking forces, the boat is said to "lose her bank." She heels outward, that is, and nearly gives her driver heart failure. A high center of gravity, a shallow rudder, and sections upon which the transverse squatting force does not operate strongly enough, will cause a boat to lose her bank on the sharp part of the turn. A convex bottom is likely to give beautiful banking all through the curve, and a good concave "V" bottom design will do it, too.

If a hull has a natural tendency to excessive banking, she may have to have a deep rudder. In an excessive bank there must be enough of the blade of the rudder in the water to keep her under control. This, however, makes her extremely sensitive and causes her to bank

unpleasantly on the beginning of the turn. The ability of a deep rudder to heel a boat inward was made use of in the old-time narrow, round-bottom displacement racing boats — the "toothpick" models. If the boat rolled down a bit, say, to starboard, a quick short turn on the steering wheel throwing the rudder to port would lift the starboard side with but little change in direction. On a turn, however, those boats almost always rolled outward from centrifugal force. They were too deeply immersed to allow sufficient cross-flow underneath to cause a transverse squat.

Eccentricities of racing boats, due to vagaries in rudder choice, are still encountered far and wide. A prominent one that continues to appear has to do with a streamlined rudder. Designers and racing enthusiasts have made streamlining almost a fetish in recent years. In it they have been guided by aviation design, mainly, and also by the success of streamlined automobiles built for new speed records. Did I say "guided?" "Misguided" is the word.

In motor boats streamlining above the water line may be of some advantage, but it is negligible compared to the problems involving the tremendous forces in action below when a fast boat is at speed. A single small reduc-



Section of a streamlined rudder blade showing how blunt nose throws water away from the effective steering surface

Section of sharp rudder blade which gives proper control of boat

tion in the drag of the water, or increase in the lifting surface in the proper place, will give bigger results in efficiency than streamlining above the water. However, the streamlined hull is a "snappy" design, pleasing to the eye and suggestive of speed and smooth running.

When it comes to streamlining the rudder, that is something else again. Eager to obtain the absolute maximum in speed by reducing every possible resistance, many people still talk of streamlined rudders. It sounds fine, but the problem is not one of aviation and the medium concerned is not air. The boat must travel over the medium, not through it, and the speeds of most racing classes of motor boats are not yet fast enough to demand streamlining. Look at the *Miss America's*, for instance. Are they streamlined — those big, wide, rugged-lined speed scows, with flat sides, flat decks, sharp gunwales and vertical stern transoms?

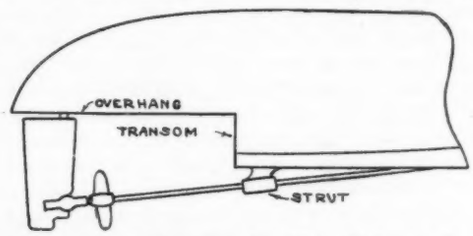
Water, too, is heavier than air and moves less rapidly. This soon becomes apparent when a streamlined rudder is tried out on a fast boat. Whereupon streamlining of this particular gadget is classed with painting the lily and other known methods of getting bad results with good intentions. And this is why: Most streamlining today is of the blunt-nosed variety. The theory is that the taper makes for easier getaway, while the blunt nose makes for strength, the entrance resistance not being the main force. True in air.

But when that blunt nose parts the water it does so at such a wide angle that the water is deflected out to each side, away from the sides of the rudder blade. And what happens? The steering wheel is loose in the hand, can be moved with the tip of one finger, and unless moved through a considerable arc it has no effect upon the course of the boat! Only when the rudder blade has been moved far enough to one side to enable it to make appreciable contact with unbroken, or less broken, water, does the boat obey the wheel. Even then, the steering is not often satisfactory. And with streamlining that allows the long taper forward as well as aft, this same situation holds, although to a lesser extent. The forward surface would be active in response to the wheel, but the tapered after surface would not until the blade was moved to a greater angle to the line of travel.

Obviously, then, streamlining a rudder is impractical. It is better to sharpen the forward edge of the rudder, with a long taper to the fined edge forward and a slight taper aft to a fairly blunt after edge. This makes an effective rudder and satisfies the hunger for streamlining. It is also the most that can be done in the matter.

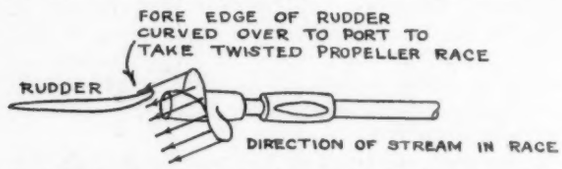
A skeg or strut on the propeller shaft placed too close to the transom creates a condition similar to that of a streamlined rudder blade, viz., broken water that reduces the efficiency of both propeller and rudder. The strut divides the water and the propeller acts as a partial surface wheel — with a gap cut out of its disc. The rudder, following in a sort of froth, has very little effect.

A well-known fast boat on which a strut had been placed too close to the transom acted in this manner: At full throttle she wouldn't turn! That is, by any reasonable yank on the steering wheel. Only when the driver cut down his power and reduced his speed would



Arrangement of strut and rudder which proved unsatisfactory, but when the strut was removed the boat turned perfectly

she respond. Then she would steer perfectly. At speed the strut cut up the water so thoroughly that the rudder could not act. The strut was so close and the boat so fast that the water could not fill in between them. Hence the mysterious behavior. This same thing has happened to the writer's certain knowledge on several well-known



Looking down on a right-hand propeller showing how rudder can be used to gain thrust from the propeller race

Gold Cup boats of both the displacement and hydroplane designs in recent years.

Incidentally, skeg or strut, wherever placed, offer resistance to the side swing of the stern when the rudder is turning the boat, and thus slows down the boat's response to the steering wheel. This varies, naturally, with the size of the skeg or strut and the speed of the boat. To offset this slowing effect on the turns, racing boats often have no strut, but the tip of the propeller shaft is supported by the rudder post with a little trunnion bearing.

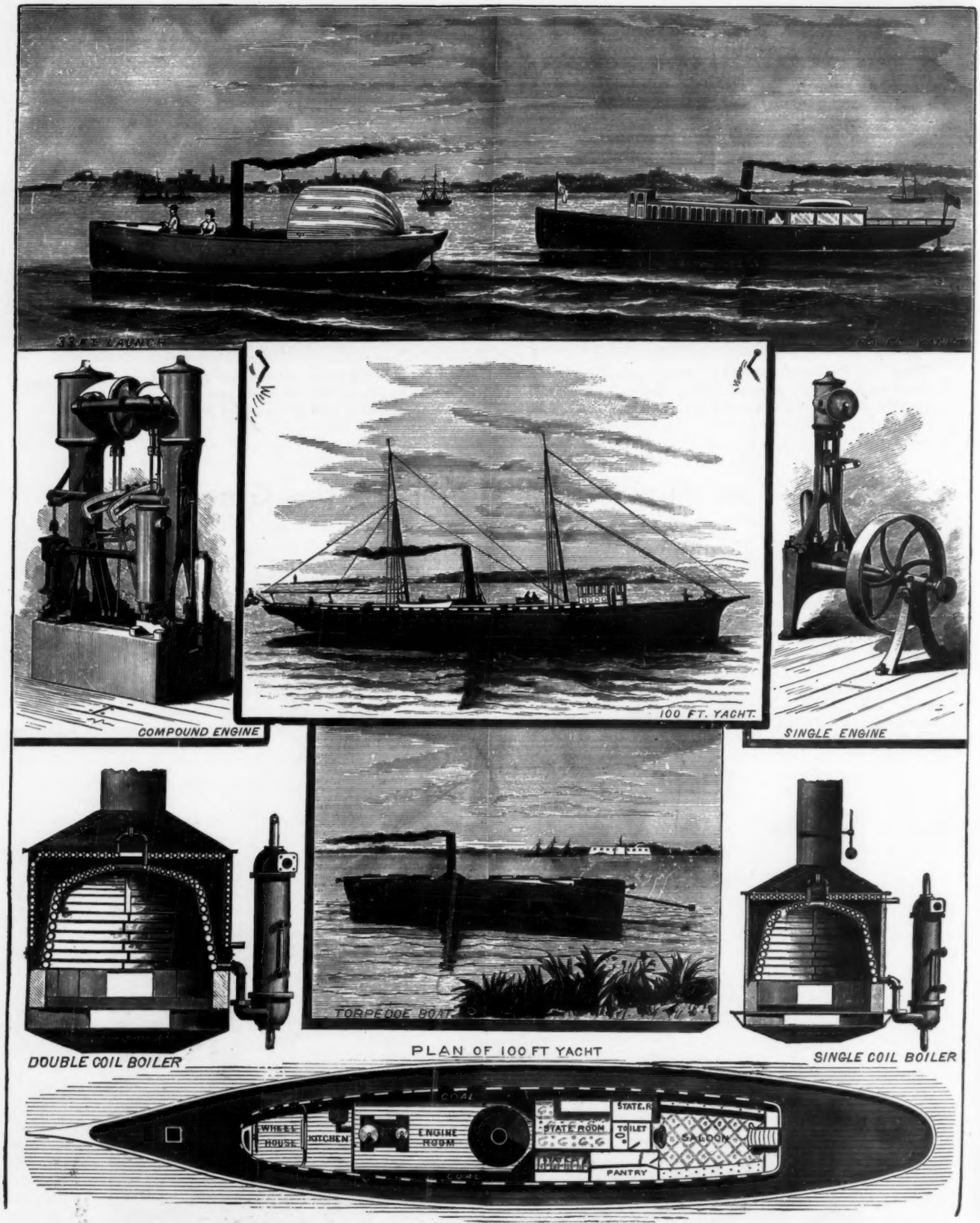
(*Continued on page 94*)

"Ken Ross," a handsome express cruiser owned by Thompson Ross, of New York, from designs by George F. Crouch. This small fast cruiser has a number of novel features in her design which are pleasing to the eye and add to her efficiency. She is 42 feet in length, by 9¾ feet beam, and is capable of a speed of 40 m.p.h. with a pair of 6-cylinder Sterling Petrels.

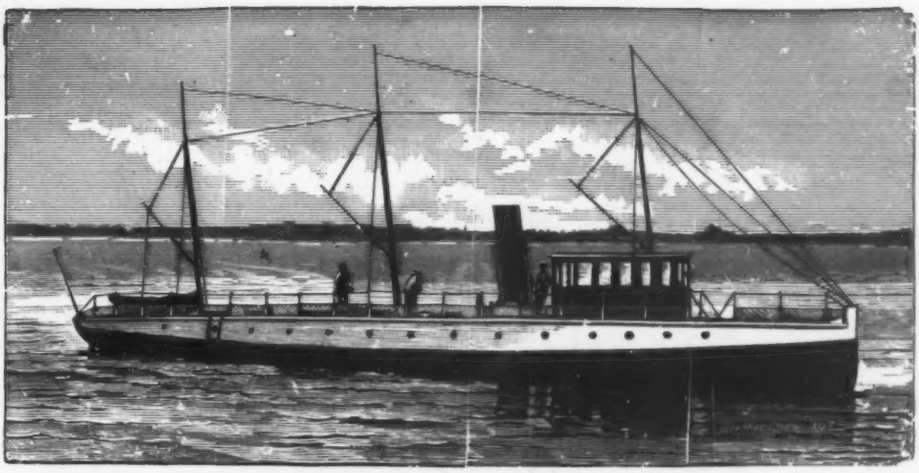
"Yawin," an Auxiliary Schooner for the Great Lakes

Built for cruising on the Great Lakes, and owned by E. N. Murphy, of Green Bay, Wisconsin, "Yawin" was designed by C. D. Mower and built by the Burger Boat Company, of Manitowoc. She is 63 feet long over all, by 16 feet beam, and 7 feet 9 inches draft

Under a flush deck, the accommodations below are excellent and include a large main cabin with three built-in berths, deep transoms, and a folding dining table. There is also an after cabin, or stateroom, sleeping two. "Yawin" is most attractive below, as the photograph indicates



At the top (left) is shown a launch built by the Herreshoffs for the U. S. Navy in the eighties, while astern of her is a 60-foot cabin launch of the same period. The compound steam engine at the left represents a common type of marine engine used from 1878 to 1885. The 100-foot steam yacht "Gleam" in the center, a masterpiece in her day, was built in 1880 for William Graham, of Baltimore. The smaller steam engine at the right was a stationary type used in shops. The two steam coil boilers, equipped with steam separators at the side, were used until 1882, when the type became obsolete. The torpedo boat was one of the five built at the Herreshoff Works in 1880 for various governments. The cabin plan of "Gleam" is typical of the period



The steam yacht "Stiletto," from an old wood cut. Built in the eighties of the last century, she did 23 knots and was later converted into a torpedo boat

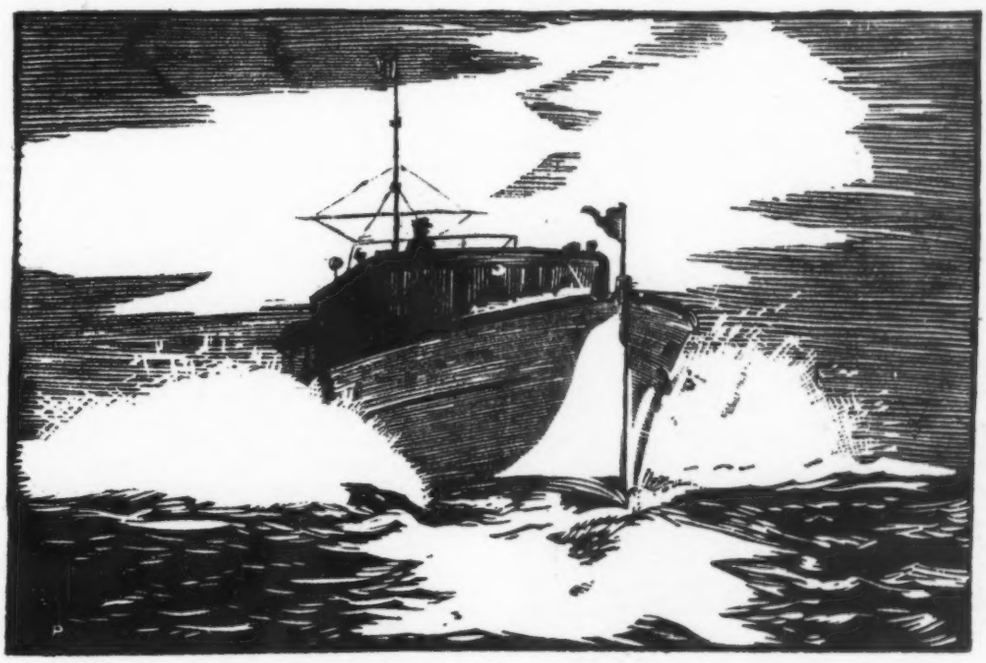
Fifty Years Ago

IN RUMMAGING through a loft at the Herreshoff plant at Bristol, R. I., a few weeks ago, a plate made from some old wood cuts was uncovered, which, when cleaned up, proved to be a group of early steam launches, yachts and power plants indicative of the early work of the Herreshoffs, then the leading builders of fast power-driven craft in the United States. We are privileged to reproduce these here. With the recent Motor Boat Show fresh in our minds, they make interesting the comparison of power yachting of fifty years ago and today.

Steam, then, was the only power for boat propulsion outside of sails, and the engines were simple affairs of one or two cylinders. Compound engines, for making use of steam at different pressures, still had a long way to go. All of the hulls of these boats were of wood, even to the torpedo boat, the one shown here being something in the nature of an experiment. This torpedo boat was 58 feet long on deck and was designed to approach the enemy under cover, when the long torpedo pole at the bow was lowered and the bomb at the end exploded in contact with the ship.

The steam yacht *Stiletto* was a famous boat in her day, and faster than anything in this country at the time, making 23 knots. She was designed by N. G. Herreshoff as a yacht, but later she was changed to a torpedo boat. With improvements to her power plant for this service she was rated as a 25-knot boat.

We have surely come a long ways from these early efforts at speed upon the water to the modern high-speed runabout or commuter, with speeds of 50 or 60 miles regarded as nothing out of the usual.



1932

From a wood cut by C. E. Pont

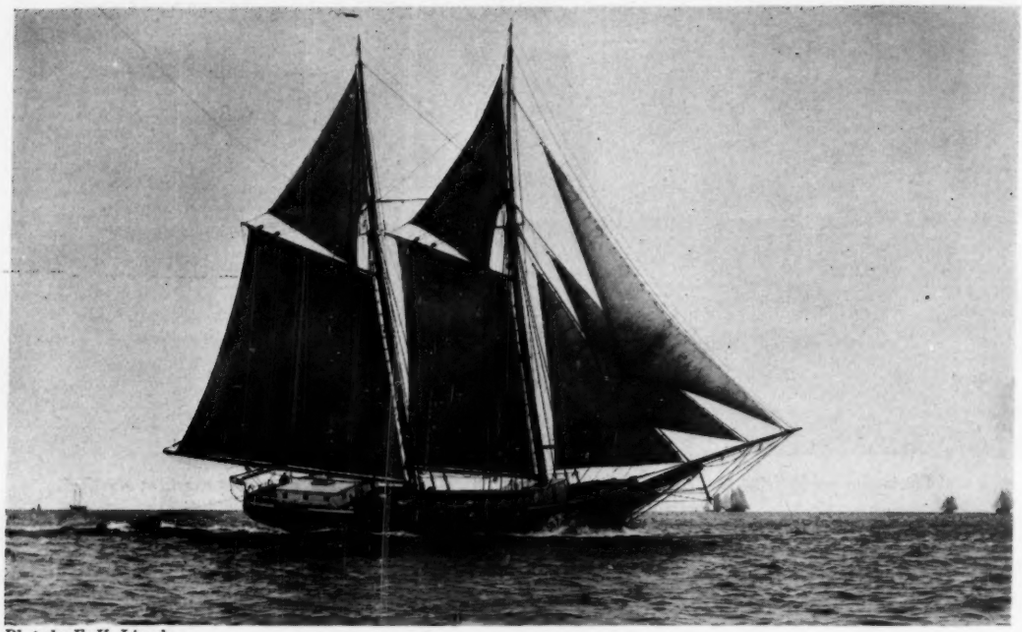


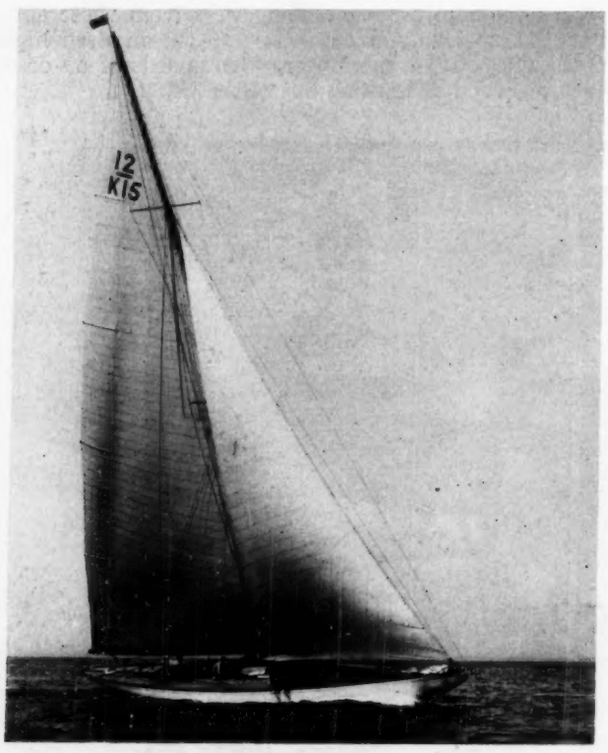
Photo by E. H. Lincoln

Flying light! A small coaster beating out of New London harbor in 1888, when most of the traffic on the Sound was carried under canvas

The Month in Yachting

New Jersey Yachting Prospects

THE outstanding development of the winter in New Jersey yachting circles is the formation of the South Jersey fleet of the International Star Class which will sail on Great Egg Harbor and make its headquarters at the Ocean City Yacht Club. It is most encouraging to see windjamming make a revival here, for sailing has practically died out in all waters south of Beach Haven. A most active season for the newest Star fleet will start in February, when Philip Bower takes *Okla III*, crack Pequot Yacht Club Star which he has bought, to Havana for the Midwinter Championships. Team races for the Barnegat Bay and South Jersey fleets will be held during the summer.



"Mouette," the latest addition to the Twelve-Metre Class in this country. Designed by Nicholson, and formerly owned by T. O. M. Sopworth, she has been purchased by Mr. Horace Havemeyer

The Barnegat Bay Yacht Racing Association has again challenged the Royal St. Lawrence Yacht Club of Montreal to sail an eight-race series in the bilgeboard scows, this being the seventh consecutive year for this event. Canada has now taken four to Barnegat's two. Dates have not yet been set, but as in past years four of the races will be sailed on Lake St. Louis and a like number on Barnegat, off Seaside Park.

For the past few years the Barnegat Bay Yacht Racing Association and the Little Egg Harbor Yacht Club of Beach Haven have been racing with each other, and the schedule makers are now endeavoring to increase this interclub competition. At the final regatta of 1931, which was held at Beach Haven, exactly 120 entries started during the day in the various classes, a record for New Jersey waters. The interclub rivalry has done much to popularize the sport in the past and has helped make this figure possible. To insure a future healthy growth it is desired to widen the schedule in this direction.

The opening of Manasquan Inlet, which is now available to yachtsmen journeying toward Barnegat or points south from the metropolitan area is an ever more important factor in increasing the popularity of these waters. The federal, state and local governments contributed to finance a splendidly constructed channel not only at the inlet, which is protected by stone jetties similar to those at Cape May, but through the Manasquan River and the canal which leads into Barnegat Bay, at Bay Head.

CHAS. E. LUCKE

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Scotland to Buenos Aires in a 33-Footer

INGRID a 33-foot double-ender designed by C. O. Liljegren, of Quincy, Mass., recently completed a passage of 6,000 miles from Aberdeen, Scotland, to Buenos Aires, Argentina,

Photo by Jackson

The Thirty-Square-Metre Class at Marblehead, where there is a sizeable fleet of these "Skerry Cruisers"

with a crew of four. No details of the trip are available as yet except that the little yacht made a good passage.

On an over all length of 33 feet and beam of 11 feet 5 inches, *Ingrid* draws 6 feet and is a typical Scandinavian double-ender with outside ballast and rather long overhangs. The successful passage of this little sloop is further tribute to the ability of this type of yacht.

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C. Oliver Iselin

ONE of the outstanding figures in yachting a generation ago passed away when C. Oliver Iselin died on January 1st of this year, at the age of 78 years. Prominently identified with yacht racing from 1880 to 1905, or thereabouts, it is principally in connection with the defense of the America's Cup that he was best known to present day yachtsmen.

Oliver Iselin, with his elder brother, William E. Iselin, began his yachting career on Long Island Sound somewhere in the seventies of the last century. Together they sailed in yachts of various sizes and types, and both kept their interest in the sport for many years. In 1893, when the Earl of Dunraven challenged for the America's Cup with the *Valkyrie*, C. Oliver Iselin became the active head of a syndicate of prominent New York yachtsmen that built *Vigilant* as a candidate for the defense. The syndicate went to the Herreshoffs for the design, and in the trial races, between four candidates, *Vigilant* proved the best and was chosen to defend. Throughout the trial series and during the international match that followed, Mr. Iselin acted as managing owner of the *Vigilant*, although Captain William Hansen sailed her successfully in the three races against *Valkyrie*. Thus began a connection for Mr. Iselin with the defense of the Cup which lasted until 1903, when he was manager of the big defender *Reliance*. In 1895, when in charge of *Defender*, which sailed against *Valkyrie II*, the series ended in charges of bad faith by Dunraven, who claimed that the American yacht had secretly taken aboard ballast after she was measured. This charge was disproved and found to have no foundation. Lord Dunraven was later dropped from honorary membership in the New York Yacht Club. In the races against Sir Thomas Lipton's first three *Shamrocks*, Oliver Iselin acted as managing owner of the *Columbia*, in the match of 1899, and of *Reliance* in 1903. This was his last active participation in the defense of the America's Cup.

Mr. Iselin is survived by a son who is interested in yachting, Adrian Iselin 2nd, who has won several international series in the Star Class.

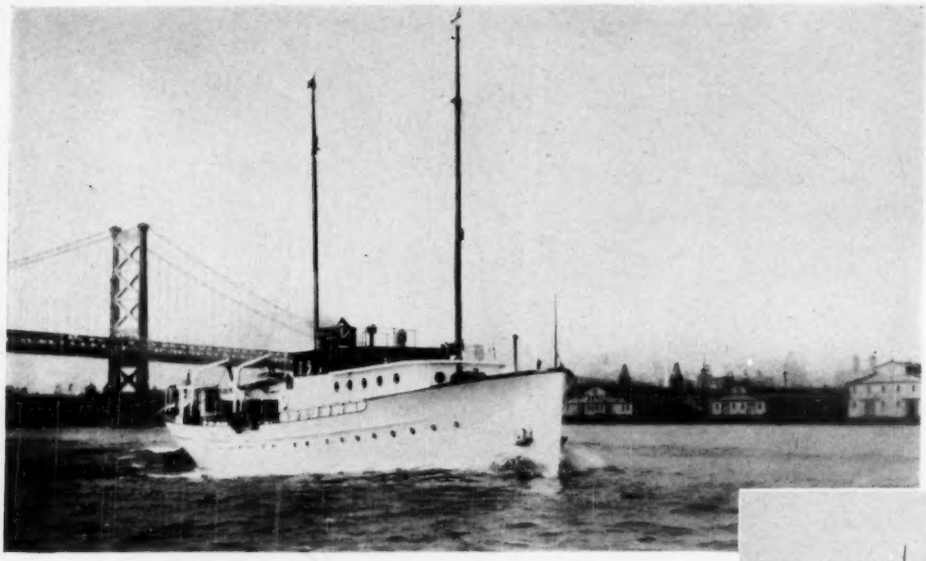
Elected to membership in the New York Yacht Club in 1877, C. Oliver Iselin stood number four on the club roster at the time of his death.

One-Design Built in St. Augustine

WITH the idea of stimulating sailing in Northern Florida waters, *Gaviota*, a little sloop which appears in an accompanying photograph, was built in St. Augustine, Florida, last spring by H. N. Rodenbaugh, from designs of the well-known Nantucket one-design class, turned out by John Alden. She is 21′ over all, 6′ 5″ beam and draws 1′ 4″, with a sail area of 222 square feet.

Matanzas Bay, fronting St. Augustine, provides ideal sailing for this type of boat and it is hoped that a class may be developed, stimulated by the interest shown in this Florida-built boat.

"Gaviota," a Florida-built 21-footer on Matanzas Inlet, St. Augustine. She is owned by H. N. Rodenbaugh, who hopes to get a class started in those waters



"Arminia," a steel 110-foot Diesel cruiser owned by General W. W. Atterbury. An able, sturdy yacht, "Arminia" made a cruise last year from Philadelphia to Alaska and return, with many long runs. Mathis Yacht Building Co. were the builders

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"Ingrid," a little 33-foot double-ender which recently completed a long voyage from Scotland to Buenos Aires, with a crew of four

The Central New York Yacht Racing Association

SAILING on the lakes of New York State has become so popular during the past few years that a yacht racing association to meet the needs of the racing fraternity has been formed recently. The association is known as the Central New York Yacht Racing Association, and is composed of the Owasco Yacht Club, of Auburn; the Seneca Yacht Club, of Geneva; the Cooperstown Country Club, of Cooperstown; the Syracuse Yacht and Country Club, with a clubhouse on Oneida Lake; the Ithaca Yacht Club; the Oswego Yacht Club; the Henderson Harbor Yacht Club, and the Casenovia Yacht Club. With the exception of the Oswego and Henderson Harbor clubs, which are on Lake Ontario, all of the clubs are located on the Finger Lakes or similar small lakes of the central part of the state. Many of these lakes are connected by the waterways of the Barge Canal System.

The organization was formed as the result of an invitation regatta held in August, 1930, by the Syracuse Yacht and Country Club. This regatta brought together the Star boats of Cooperstown, Geneva, Oswego, and Syracuse. It demonstrated conclusively the practicability of holding inter-lake races and brought together the men who could make such an idea an actuality.

In October of the same year the clubs which had become interested were asked to send representatives to a meeting in Auburn. As a result of this meeting the C. N. Y. R. A. was formed as it now exists, and it was decided that an annual regatta should be held. The Seneca Yacht Club came forward with an invitation to hold this meet at Geneva on Seneca Lake in 1931, which was promptly accepted. Mr. Lithgow Osborn was elected president of the association and Dr. A. C. Abbott, vice-president.

E. Levick

A new Curry 20-Square-Metre racer which was exhibited at the New York Motor Boat Show. The first of these craft to be seen in the United States

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The Fate of Gerbault's "Firecrest"

IN THE November issue of YACHTING we reported that Alain Gerbault's old *Firecrest* sank in a sudden squall while being towed from Cherbourg to Brest by a French torpedo boat. We have been recently informed, however, that she was practically towed under and that she foundered as a result of her hull starting under the enormous strain caused by towing at an excessive speed.

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Regattas of the Frostbite Yacht Club

IT ALL happened because Larchmont Bill Swan and Wild Bill Taylor became embroiled in an argument as to which was the "more hard boiled" sailor. In order to settle the argument, it was finally decided to sail a match race in 11-foot sailing

The "Frostbites" barging down on the line in one of the series of winter dinghy races sailed on Manhasset Bay in January

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Making sail preparatory to a race in the Frostbite regatta

E. Levick

dinghies on New Year's Day, on Manhasset Bay, the skipper the least frostbitten at the finish to be adjudged the winner. The news of the contest got abroad, with the result that when the appointed hour arrived, no less than eight dinghies were on hand, and about fifty people anxious to sail them, despite the fact that it was blowing hard from the east, with intermittent squalls of rain, sleet, snow and hail.

No less than three races were sailed that afternoon. As fast as one set of skippers and their crews clambered aboard H. Martyn (Slim) Baker's trim yawl *Ranger* to get thawed out, others grabbed the dinks and went out to become hard boiled — or half frozen. And the whole crowd, between gulps of steaming hot coffee and clam chowder, formed the Frostbite Yacht Club, and elected Slim Baker commodore, Bill Taylor vice-commodore, and Jack Dickerson rear commodore, the latter having arrived at the scene of carnage with his ketch *Half Moon*.

Another regatta took place the next day, with somewhat lighter winds and less rain. Whereupon it was decided to continue the series every week-end throughout the winter, or until the harbors froze over.

So the following Saturday the fleet foregathered at the New Rochelle Yacht Club, with the "mother ships" augmented by Snowden Andrews' motor cruiser *Tar Baby* and the sloop *Snug*. Half a dozen short races were sailed that afternoon, and nine more on Sunday, in moderate to fresh northwest winds. Over the week-end of January 16th–17th the fleet, now numbering some twelve dinks, returned to Port Washington, and eighteen races were sailed in two days, with Butler Whiting handing out mug-ups from the hastily-commissioned auxiliary sloop *Exit*.

Informality reigns supreme in the regattas of the Frostbite Yacht Club. All hands, old and young, male and female, skipper the boats. One race, for commodores, past and present, was won by Jack Shethar, with Bob Bavier second, followed by Slim Baker, Hobart Ford, Butler Whiting and Marty Kattenhorn. Porter Buck and Olin Stephens each sailed *Dorade, Jr.*, to victory. Artie Knapp and Herb Atkin, both Star Class experts, won one or more races apiece. Lorna Whittlesey won three or four, and lost one when her dink persisted in sailing backwards for five minutes. Just to prove how safe the dinks were, Artie Knapp took Bill Taylor's eight-month-old son for a spin, after having initiated no less a personage than Captain Bob Bartlett into the joys of dinghy sailing the week previous. Father and Son were represented by George and Ernest Ratsey, and when one didn't win the other did the honors for the family.

So far, not a dink has upset, and no one has become permanently frozen. If the astonishingly mild weather continues, the Frostbiters, gathering new and enthusiastic members every week, will continue racing every week-end until it is time to strip the winter covers from the larger craft. Then they'll keep right on racing, even though they have to re-name their organization the Sunburn Yacht Club.

M. Rosenfeld

George Ratsey sailing one of his new dinghies off City Island. The sport is rapidly gaining popularity on the Sound

Comment from Our Readers

Cruisers and Ocean Racers

Editor YACHTING:

I HAVE been intending to write you ever since I received the December copy of YACHTING. There are a number of very interesting articles in this issue. Most of them I do not agree with.

I read with interest Sherman Hoyt's comments on ocean racing. It seems that we now have a new class, that is, the ocean racers. Before, we had just the cruising class and the racing class.

Personally, I feel that these ocean racers should join in with the rest of the racers and make rules to cover these ocean races if they want them. I feel that they should not race with the strictly cruising boats. If the rules that they develop are along the lines Mr. Hoyt suggests, with no sail area measurement, I can see some mighty expensive toys developed that, although they will be safe enough to race in, will be out of the question to race against in cruising boats which are designed and built for comfort and to which racing is secondary.

Mr. Hoyt further points out that a good many races are won when the wind is light. With no limit to sails or sail area, I can vision the development in two or three years of a snug rig for heavy breezes, with an extended bowsprit and an extended main boom, and an additional topmast which would be housed when the wind was blowing. Also, an extra spinnaker pole the full length of the boat, or longer, which would treble the amount of canvas when the wind was light. This, as Mr. Hoyt points out, would carry him through the soft spots very nicely.

The interior of the boat would be divided up into sail lockers and the crew could sleep either in the sail lockers or in pipe berths, one over the other, in the forepeak. These places, of course, would have no engines in them. Now I agree that this would make a very nice class and would be plenty exciting if a squall hit one of them in the night with all these extra kites aloft.

What I can't see is where this hitches up in any way with the races for cruising boats. From my way of looking at it, a race for cruising boats is more or less a fat man's race, that is, if not taken too seriously, and with no squabbles after the race is over. The cruising boats would certainly like to be left alone to run their own fat man's race without having some athlete step in and make them look like thirty cents.

Also, can't agree with Loomis, who seems to object to winning alone. All cruising men cannot and do not have the expert racing crews Sherman Hoyt speaks of. Quite often the owner of a cruising boat, who would like to take in a race, goes in knowing that if things get too bad his physical condition will not allow him to finish the race. It is going to be pretty bad if the owner, before he enters a cruising race, has to sign an affidavit that he will finish the race even if he finds it necessary to finish crawling in on his hands and knees, or be eternally damned if he gives up. Also there are a lot of us who are beginners in these cruising races where the dark night sometimes looks awfully black and the wind seems twice as strong as it really is. We are not all hardy salts, like Mr. Loomis. I have enjoyed his other articles very much but certainly can't give this one much.

Then I came to Sam Wetherill's article regarding limiting sails on ocean racers. I think he's got his title mixed. I don't think he knows much about ocean racers. He writes about cruising boats, and his article is okay from that slant. I am in favor of it 100 per cent. Also, I am in favor of letting ocean racers race anything and how they wish, but let them race in a separate class.

Then I came to two designs of cutters, both of them about the same size, one with twice as much room as the other in it; the roomy one is a cruising boat, although the article doesn't say so. But anybody can tell that she is and you don't need any heading. The other one tells plainly in the heading that she is a cruising sloop — no one would have known it otherwise. In my opinion this is a boat developed to get into the cruising class just by the skin of her teeth and walk away with the races, which, of course, will mess things up. Owners of strictly cruising boats will not continue racing against a boat of this type. Anybody who is having a boat built with the idea of comfort and cruising certainly wouldn't order this packet.

We are going to do our darndest out here to bar a boat of this type, and I think we can do it. I don't think the cruising men have much chance of doing anything down there until they get the ocean racers segregated into a class of their own.

Then I came to Francis Herreshoff's article, which certainly should have been censored. The table he has made up and the designs he has drawn up will fit a power boatman only. If a man likes to sail and has power for auxiliary use only, this score is just about 100 per cent wrong. Even from a power boat standpoint, I can't agree with him. Fortunately, your printer, I believe, in setting it up, got his minus and plus signs twisted so it isn't quite as comprehensive and won't throw as many off the track as it would otherwise. But a lot of beginners may read this article and take this table, etc., as gospel, while in my opinion it is bunk.

You have an article in the beginning of your book, by Barcal, showing a boat with a Diesel in her and a cruising radius you will admit is pretty great. However, on this setup you would give the strictly cruising boat no credit for this at all. But he gives fifteen points for cruising radius under power. Also gives ten points if engine uses heavy oil.

Barcal's boat had a heavy oil engine in it but it wouldn't run. Barcal knows as much about an engine as the average sailor does . . . which is nothing. The gas engine, although a little more dangerous from the fire angle, runs when you want it to run, due to the fact that automobiles have been developed to this point. Also, why couldn't you put a heavy fuel oil engine in a boat that would sail, and have the extra safety of being able to sail when the darn thing wouldn't run, which you couldn't in the boat that gets the most points under this method of scoring.

Further, Herreshoff gives no credit for comfort. The uncomfortable outfit which he rates first, which has the toilet in the galley or the galley in the toilet (I can't decide which) certainly wouldn't appeal to me, and I wouldn't take it as a gift if I had to do my cruising in it. The 46-foot schooner which, you may gather by now I lean towards, is, without a doubt, poorly rigged for this size boat. Three headsails on a 46-foot schooner certainly would give one a pain in the neck. Also, a foretopsail.

You yourself sailed on a 44-foot schooner which I once owned, which carried three pieces of canvas in her working rig. And Herreshoff takes off 32 points for the number of ropes on this rig, the highest minus sign given. I would much rather pull two ropes, one at a time, than try to pull on one rope that had twice as much pull — and that I couldn't pull. Fact of the matter is, I think this rope score is absolutely ridiculous. I could go on by the hour criticizing this article, but I suppose you will get so many other letters along the same line that you won't have time to read them.

To make a long story short, I just want to let you know that your December YACHTING rubbed me the wrong way and I hope the January one will be better.

R. P. BENEDICT.

Chicago, Ill.

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"The Gentle Art of Quitting" from Another Angle

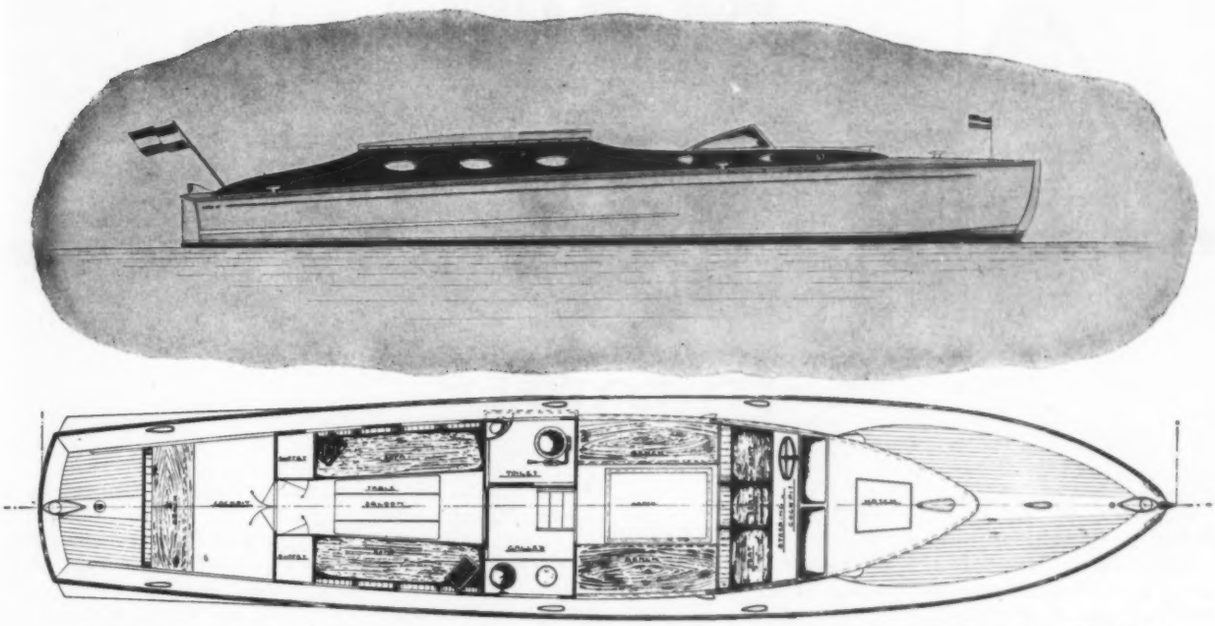
Dear Mr. Loomis:

YOUR approach to the "Gentle Art of Quitting" is so perpendicular that it has a decided rake aft. Apparently you have become so salt-encrusted and hard-bitten that it is necessary to remind you of the simple old adage that discretion (quitting as you call it) is still the better part of valor; likewise, sailing judgment, and very often in writing.

You bluster away from the deck of a new, well-found and well-equipped cutter at those who haven't the price of a new boat and new gear nor the author's leisure to spend in tuning up and becoming thoroughly acquainted with the boat. You fail to

(*Continued on page 96*)

Foreign Development in High Speed Cruisers

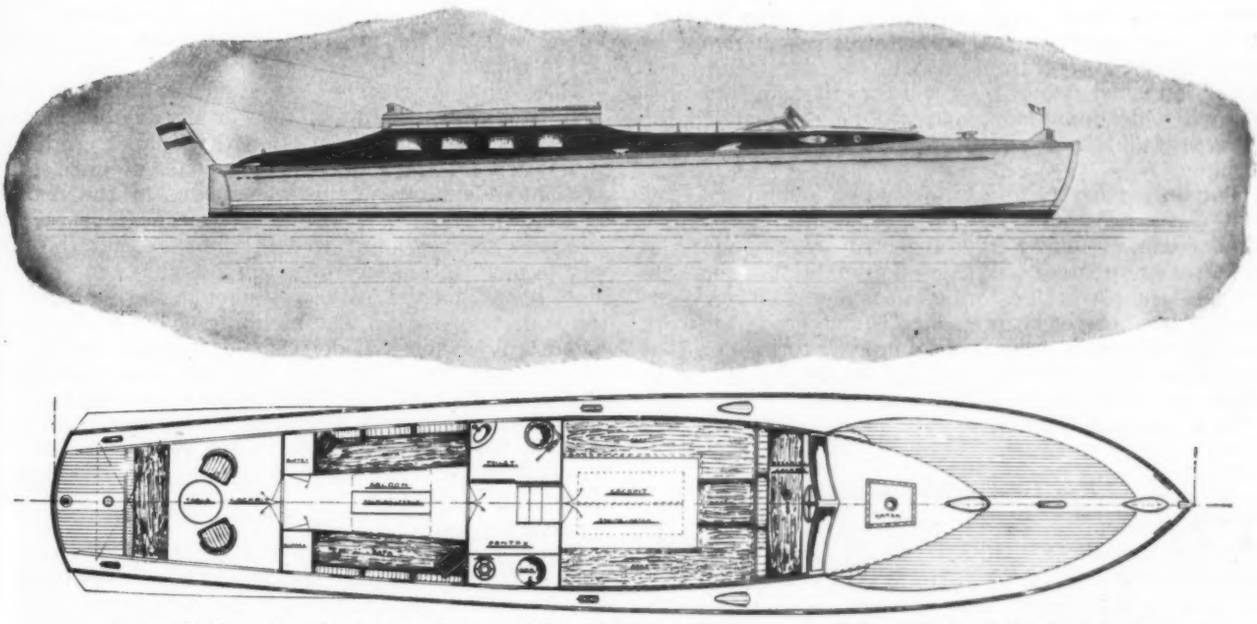


A 42-foot commuter showing the trend in this type abroad. From designs by H. W. De Voogt, Holland. Speed 28 miles

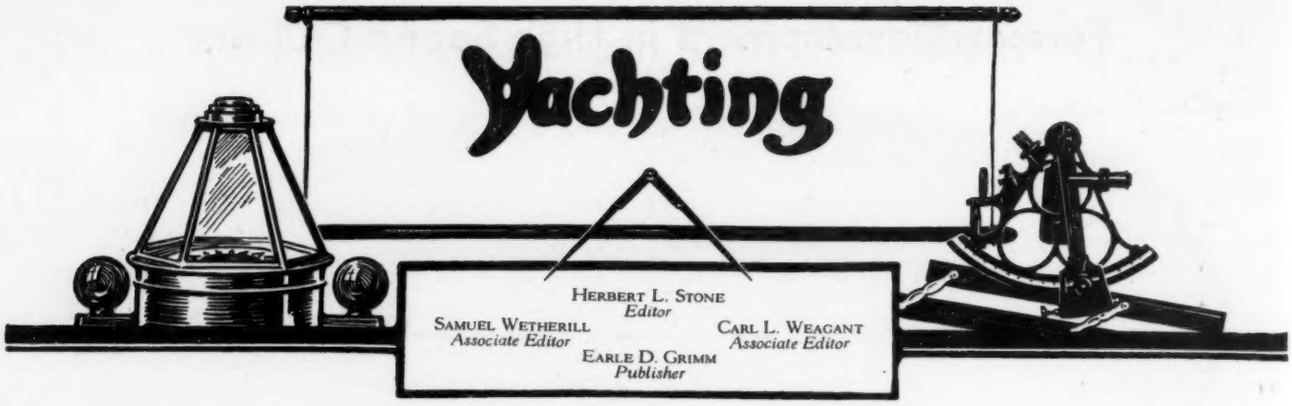
THE two commuters or fast day cruisers shown on this page are interesting because they exemplify recent foreign development in this type of boat and offer a chance for comparison with boats of the same type designed on this side of the Atlantic. These two modern cruisers are from the board of the well-known Dutch naval architect, H. W. De Voogt, who has specified double planked hulls with galvanized iron or special aluminum alloy frames, floors and engine bed in connection with intermediate and longitudinal oak frames in their construction.

The smaller boat has a length of 42′ 2″, a beam of 8′ 2″ and draft of 2′10″. There is full headroom in the main cabin, and a small cabin for the captain is provided in the forepeak. Single screw drive gives her a speed of better than 28 m.p.h.

The larger cruiser, 49′2″ overall, 9′ 2″ beam and 3′ draft, is designed for single or twin screw propulsion and is capable of speeds above 27 m.p.h. Her arrangement is the same as the smaller boat but with more spacious dimensions. The streamlined trunk cabin affords a small forecastle, abaft of which is the steering cockpit, followed by a large open cockpit with engines beneath. Stepping down into the main cabin there is a lavatory to port and galley to starboard with sleeping accommodation aft, and a spacious after cockpit.



A somewhat larger boat by the same designer is this 49-footer, with twin screws. She is very snappy in appearance



EDITORIAL

Why Not Build Now?

ANYONE thinking of building a new boat in the near future? If so, there are many reasons why he should do so at the present time, depression or no depression.

Provided one is ultimately going to have a yacht and can afford to build at all, he should certainly consider doing so this year. From almost every angle, 1932 will offer more advantages to those who want to build a yacht than any year in over a decade, not only in the matter of the price to be paid for the work, but in delivery and workmanship as well. Aside from any personal advantages that will accrue to those placing orders at this time, one should consider the need of keeping the boat yards going and providing much needed employment for shipyard workers and yacht draftsmen. The future of yachting is dependent on the naval architects and the yacht builders. These must keep their organizations intact and their yards going. This they cannot do if there is a cessation of orders.

In many cases the reasons for delay in ordering a new yacht are psychological. Even if one can afford a new boat, times look hard and the future uncertain. But no one really believes these conditions are going to last. In fact, there are signs that we are already on our way to better things, and far from thinking that the spending of money on a new yacht may call for criticism in a time of such wide depression, one will be commended for doing now all that he can afford to do to keep the wheels turning.

The only other valid reason for hesitating is a belief that the process of deflation has not run its course. No one can, of course, foretell the future. But material has already undergone great reductions. Labor costs are less, and the productivity of labor is higher. Even if the bottom has not yet been reached the necessity for work in many shipyards assures one a more favorable price at this time that probably will not be duplicated when times are better and building more brisk.

So if you can, do it now!

The Twelve-Metre Class

THE plans for an international trophy for the Twelve-Metre Class have already borne fruit in the purchase of a new racing yacht for the class, which will be seen in our waters next summer. This is *Mouette*, one of the best of the British "Twelves," and champion last year, which has recently been purchased by Mr. Horace Havemeyer from T. O. M. Sopworth. This brings the fleet in New York waters to seven boats.

Unfortunately, none of the boats here were built in this country. This would make all of our existing fleet ineligible to represent the United States in any match for the proposed trophy, the terms of which, when made, will undoubtedly call for a yacht to be designed and built in the country she represents in an international race. If we are going ahead with this fine class, it is about time that someone should have one designed and built here. It is the hope that an international race can be arranged for 1933, and unless we get busy here soon, we may be in the position of not having a boat suitable to represent the class or the country. Why not give our designers and builders a chance?

The Show Goes Over

ALTHOUGH the Motor Boat Show is not yet over at the time these lines are being written, enough was seen during the opening days of the exhibition to indicate that the public interest was in no way lessened by reason of the economic uncertainties of the present time. The attendance was large and the interest was genuine and intelligent.

Although there were not as many large boats exhibited as in past years, this we think was a move in the right direction. The emphasis was on the smaller craft, and in this respect, as well as in the matter of price, there were more exhibits within the means of the man in average circumstances than at any recent Show. Manufacturers are beginning to face the fact that the man who is most interested in getting afloat is the one who loves boats and the water well enough to do himself all the work necessary in the handling of his craft, and to whom a few thousand dollars is at present the limit of his expenditure. Eventually, he will want something larger, but he must start with what he can afford. The small boat sailor is the backbone of the sport, and, likewise, he is fast becoming the mainstay of the boat and engine builder. This the builder is at last recognizing, if we can judge from the recent Show at the Grand Central Palace.

There was more value for the dollar offered this year than in many years past; this means more persons interested, and is a good augury for the coming season, both from a business standpoint and for the future of the sport.

IN THE WORLD OF YACHTING

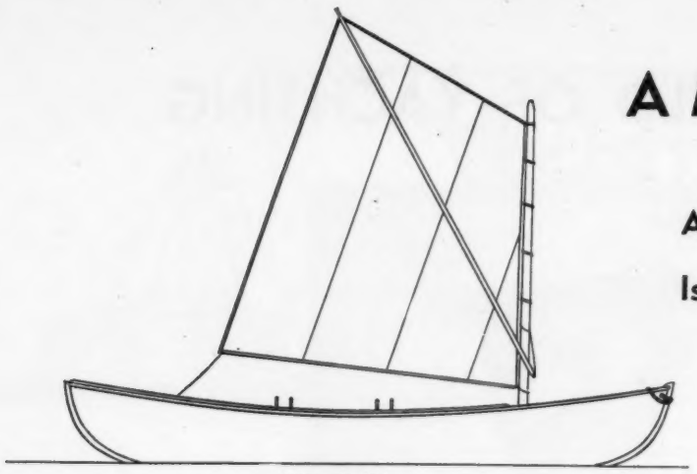
JOHNSTON DE FOREST

JOHNSTON DE FOREST, whose quest of the Seawanhaka Cup last summer took him to the Clyde with his eight-metre yacht "Priscilla III," is the subject of our sketch this month. His long yacht racing career certainly entitles him to a place in the nautical "Hall of Fame."

Though during the past ten years his name has been associated with six-metre and eight-metre boats, all bearing the name "Priscilla," Johnston de Forest had been prominent on Long Island Sound as a racing skipper many years before that, and an active member of a group at the Seawanhaka-Corinthian Yacht Club that did much for the promotion of the sport. In 1907 he bought the New York "Thirty" "Nipsi," which he raced consistently in her class, then at the height of its popularity, until 1915. Then followed two or three years in the "Minx," of the same class. When the Seawanhaka Club instigated international racing with the British in the Six-Metre Class, Mr. de Forest built the "Priscilla" in 1922, and she was active in the racing of the class until 1925. Two years later he had "Priscilla II" built, also a "Six," for the Scandinavian invasion of that year, but she did not get into the international series. In 1929 this boat was followed by "Priscilla III," an eight-metre, and one of the best so far turned out in this country. After a close elimination series between "Priscilla" and "Gypsy," the latter was chosen to defend the Seawanhaka Cup against "Caryl."

In 1930 "Priscilla III" won the Ladies' Plate trophy at Marblehead, and annexed the championship of Long Island Sound in that class by a wide margin. She was unsuccessful in her attempt to bring the Seawanhaka Cup back last year.

In addition to membership in the Seawanhaka Yacht Club, Johnston de Forest is a member of the New York and the Bar Harbor Yacht Clubs.



SAIL PLAN

A Maine "Peapod"

An Excellent Type Which Is Rapidly Disappearing

By

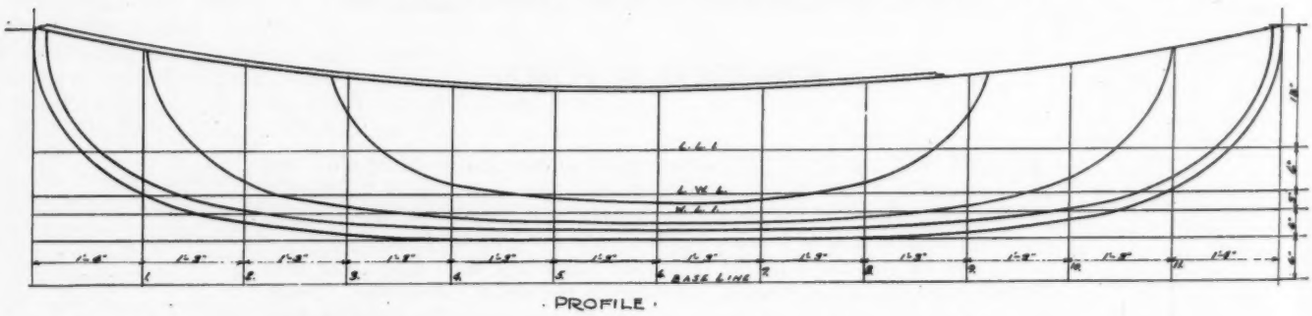
C. W. VAN NESS

THIRTY years ago the Peapod was a popular boat among the Maine lobstermen. Today, this type has nearly disappeared and in a few years more the last one will have been hauled out to rot on the beach.

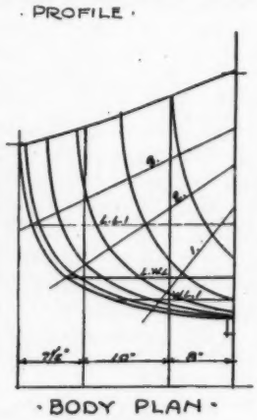
The lines here shown were taken from a boat built twenty years ago, one, therefore, comparatively new. She has been used winter and summer for lobster fishing, and is still in good condition. This boat was built in the local blacksmith shop and framed with natural bend hackmatack from the woods nearby. A glance at the lines will show that she has the easy symmetry of primitive design. The four quarters are exactly similar in size and shape. There is, undoubtedly, a close connection between this type and the whaleboat, although the Peapod is probably not a direct descendant. This model is considerably smaller than the whaleboat, being 15′ 2″ over all. She is, however, the largest practical size for one man to handle.

Besides being necessarily seaworthy, the Peapods were required to carry considerable bulk and weight in lobster pots set across the gunwales. They were piled so high fore and aft that it was necessary to row standing up. This position also made it easier to handle the traps. The Peapods rode well with a load, but they were somewhat tender without ballast. A small spritsail was nearly always carried, but the lack of a centerboard made it impossible for them to go to windward. However, these sails were used to good advantage in going out and coming home with a fair breeze.

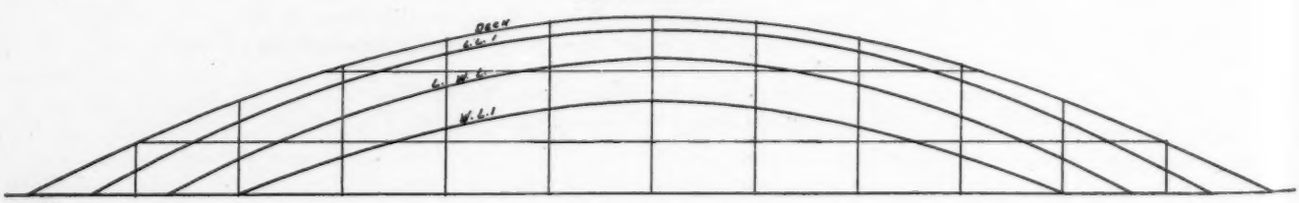
Of course the Peapod was called upon to work in all weathers, and the original owner of this particular boat related the following as a typical incident: A number of lobstermen made a practice of going out during the winter months in a small steamer, using their boats when well offshore. On this occasion the owner and his brother were pulling their traps nine miles out on a cold January day. About noon a southeast gale came on with heavy snow, and for some time they could not locate the steamer. When they did finally sight her the seas had grown so high that it was impossible for them to be taken aboard. In fact, the little steamer was laboring heavily. It was, therefore, necessary for her to run to port. The two men in the Peapod were left to come in by themselves as best they could, all the others having been taken aboard previously. It was a hard row home, but they made it. Hard work is something those men didn't mind if there was a good boat under them.



PROFILE



BODY PLAN

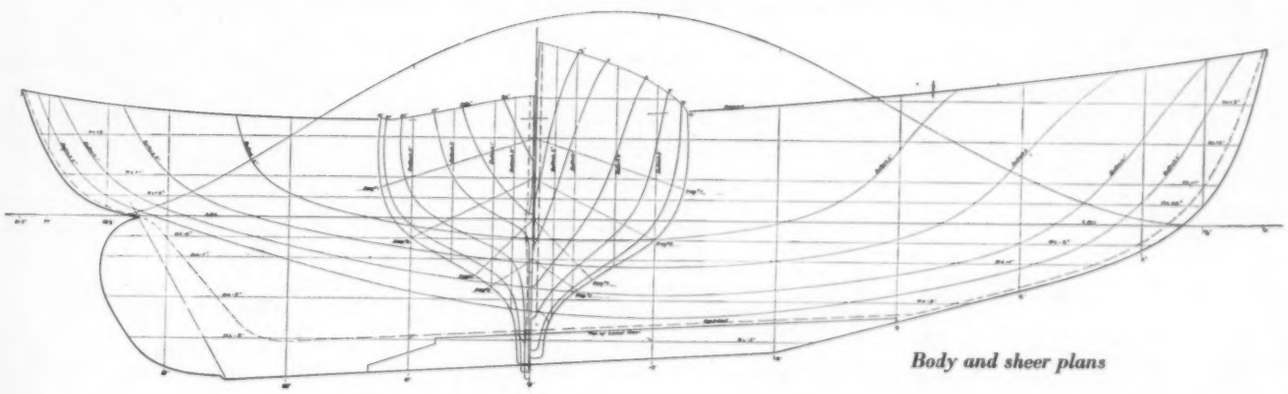


Roomy and Able

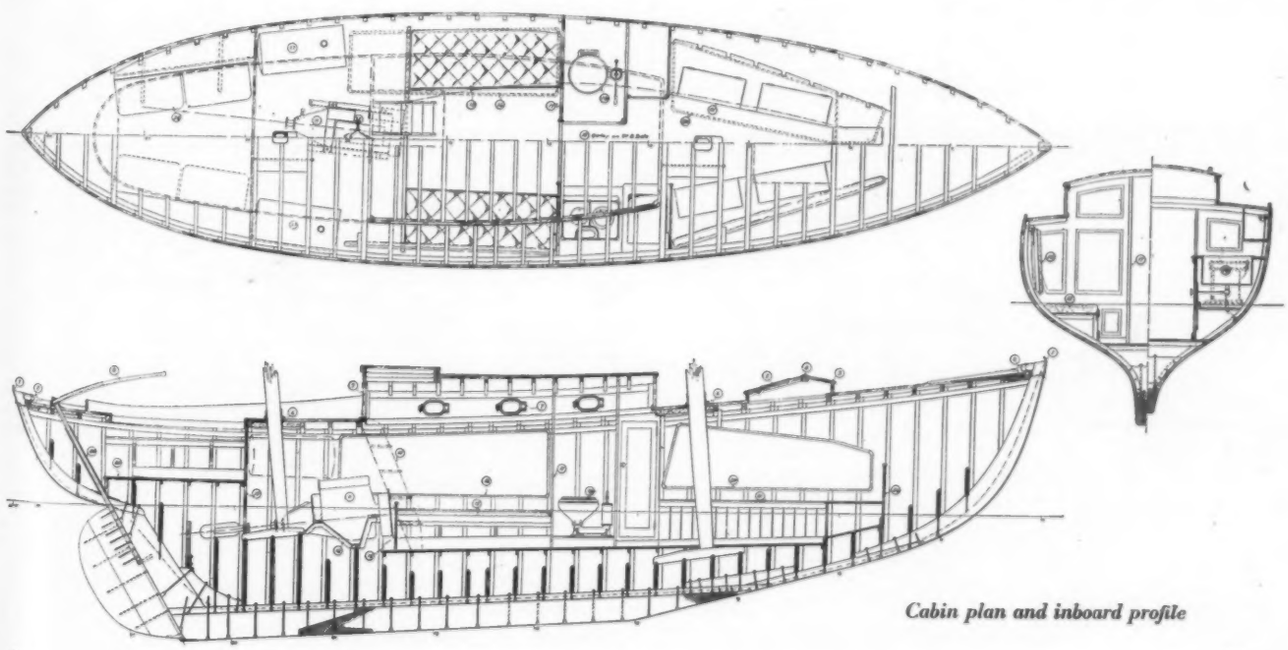
WITH the interest in small, able and roomy auxiliary cruisers increasing every year, the accompanying plans of a husky little cruising ketch, from the board of L. Francis Herreshoff, will doubtless attract considerable attention. She was designed for L. H. H. Johnson, Jr., of Boston and Marblehead, as an able, comfortable cruiser with short, easily-handled rig, and will be built in the near future. Her principal dimensions are: l.o.a. 30′ 9″; l.w.l. 26′; beam, 7′ 8″; draft, 4′; displacement, 9100 lbs. She is of the short-ended, compromise stern type, with moderate beam and firm sections, and should sail well with her modern jib-headed ketch rig, besides being decidedly easy to handle under any and all conditions.

The interior layout shows a two-berth main cabin amidships, two pipe berths forward, with toilet room and galley between, the former to port and the latter to starboard. A 4-cylinder motor, installed under the bridge deck, drives a feathering wheel on the port quarter. The cockpit and bridge deck give plenty of deck room, and there is plenty of locker space and tank capacity for extended cruising. A rugged, able and comfortable craft such as this should make a strong appeal to those yachtsmen who like to cruise in the early spring and late autumn, as well as in the summer months.

Sail plan



Body and sheer plans

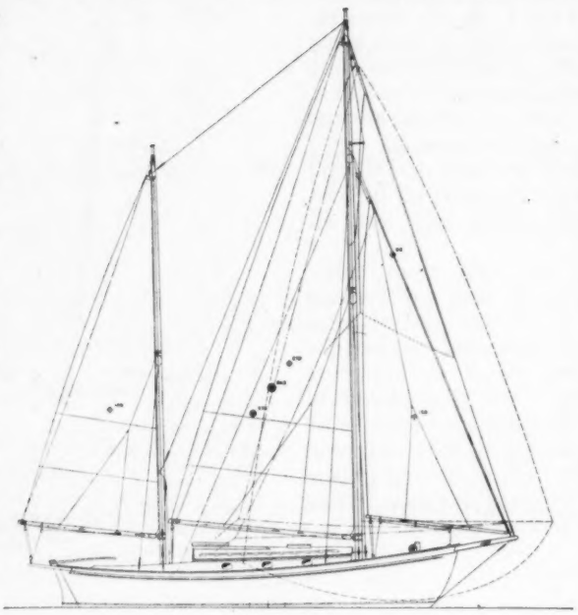


Cabin plan and inboard profile

"Dog Star"—A Small Edition of "Tidal Wave"

FIRST came *Tidal Wave*, then *Narwhal*, and next *Yo-Jo* — and now comes *Dog Star* to join the family of which *Tidal Wave* was the progenitor. This newcomer, also from the board of P. L. Rhodes, is a bit smaller than her predecessors, and was delivered last September to her owner, W. Edgar Baker, of Greenwich, Conn., a few days after she slid down the ways at the yard of M. M. Davis & Son, Solomon's Island, Maryland. Her principal dimensions are: l.o.a. 30′ 8″; l.w.l. 27′ 1″; beam, 10′ 2″; draft, 5′; sail area, 545 sq. ft.

Though a bit smaller, *Dog Star* has all the principal characteristics of *Tidal Wave*, with the profile showing a bit less forefoot and slightly more rake to the rudder post. The ketch rig is proportionately the same, and the construction is rugged and first class in every way, including such items as mahogany planking on oak frames, lead keel, Everdur bronze fastenings and hardware, hollow spars, etc. The Gray 4-30 motor, driving a Hyde feathering wheel, kicks her along at a 7-knot clip at half throttle.

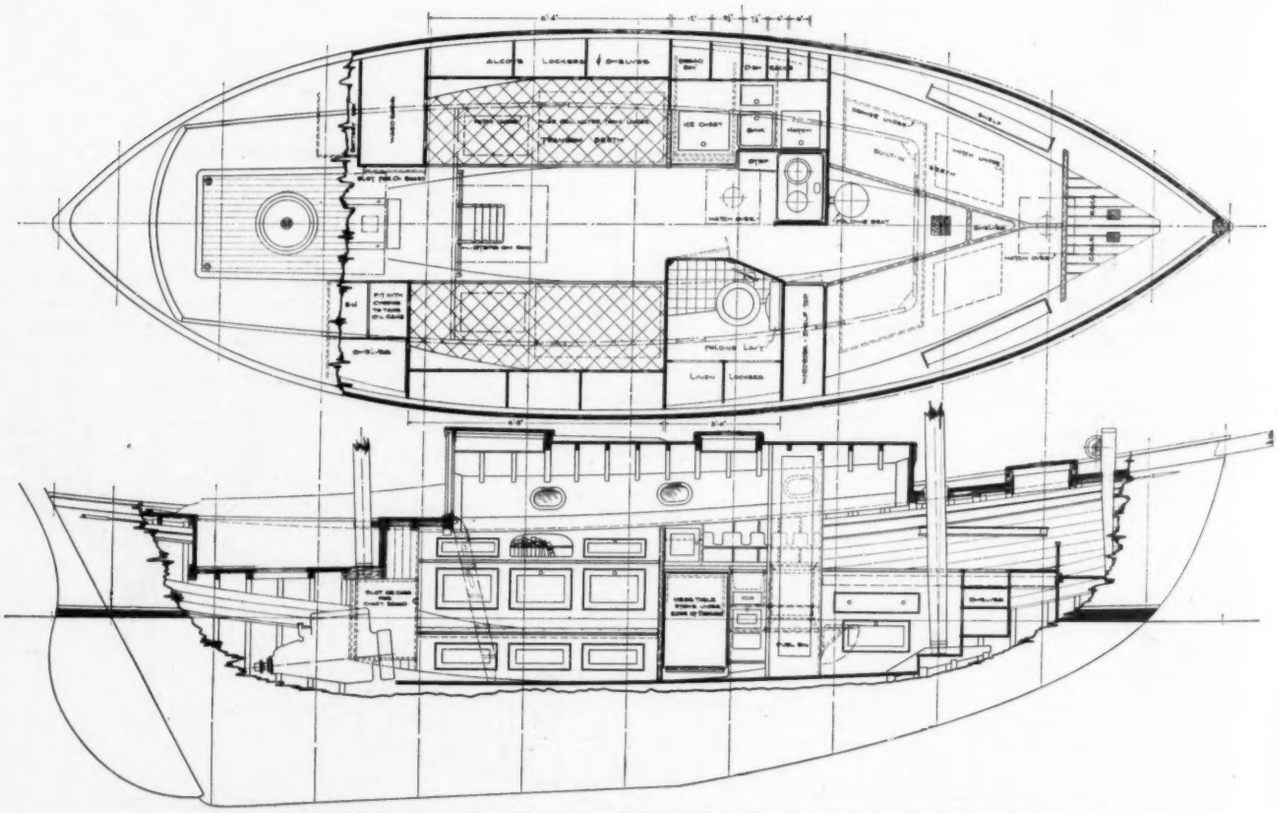


Sail plan

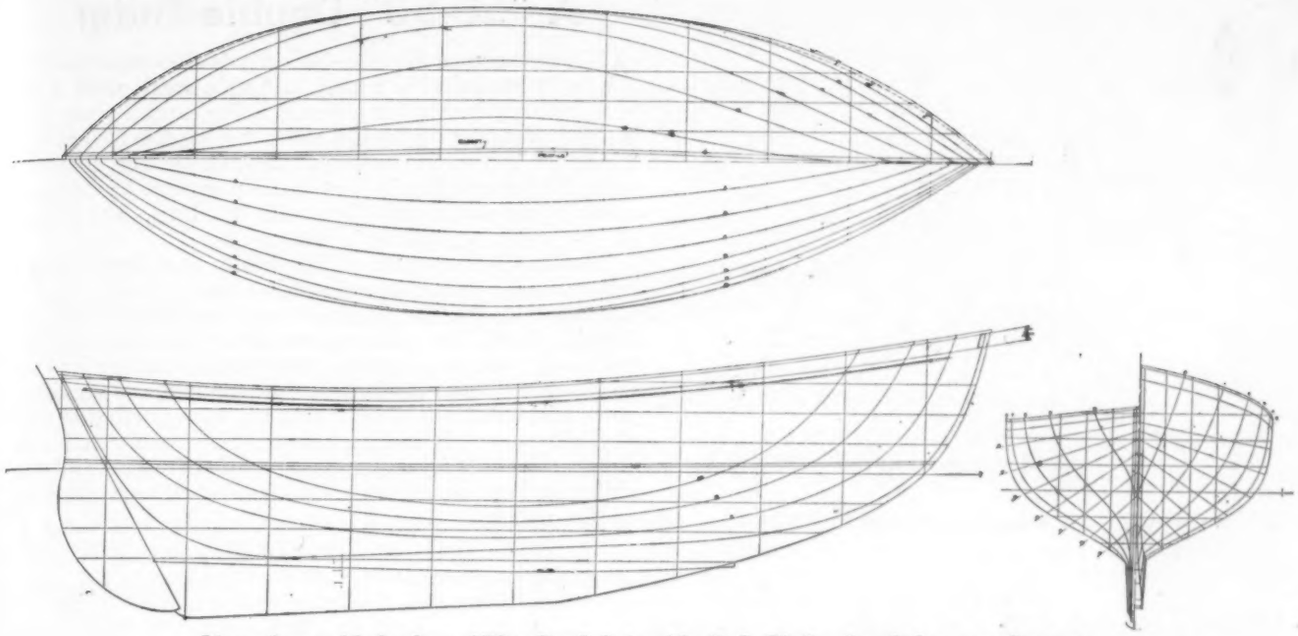
The interior layout shows a 2-berth stateroom forward, toilet room, lockers, galley and ice box amidships, and 2-berth main cabin aft, with excellent locker and storage space throughout. The motor is located well aft, the mizzenmast being stepped in tabernacle in cockpit floor.

Prior to bringing *Dog Star* to her home port on Long Island Sound, her owner did quite a bit of fall cruising in Chesapeake Bay, and reported that she sailed and handled well under all conditions. She seemed especially fast reaching, and caused remarkably little fuss in the water when traveling full speed. In a hard chance with lumpy quartering sea, she balanced and steered perfectly under jib and mizzen, and made excellent weather of it at all times.

The double-ended hull, with deep sections fore and aft, accounts for the unusual amount of room below decks. The depth of hull assures full headroom throughout. The snug, jib-headed rig of moderate area is large enough for good driving power, and extremely easy to handle by one person. The ample beam assures plenty of floor space.



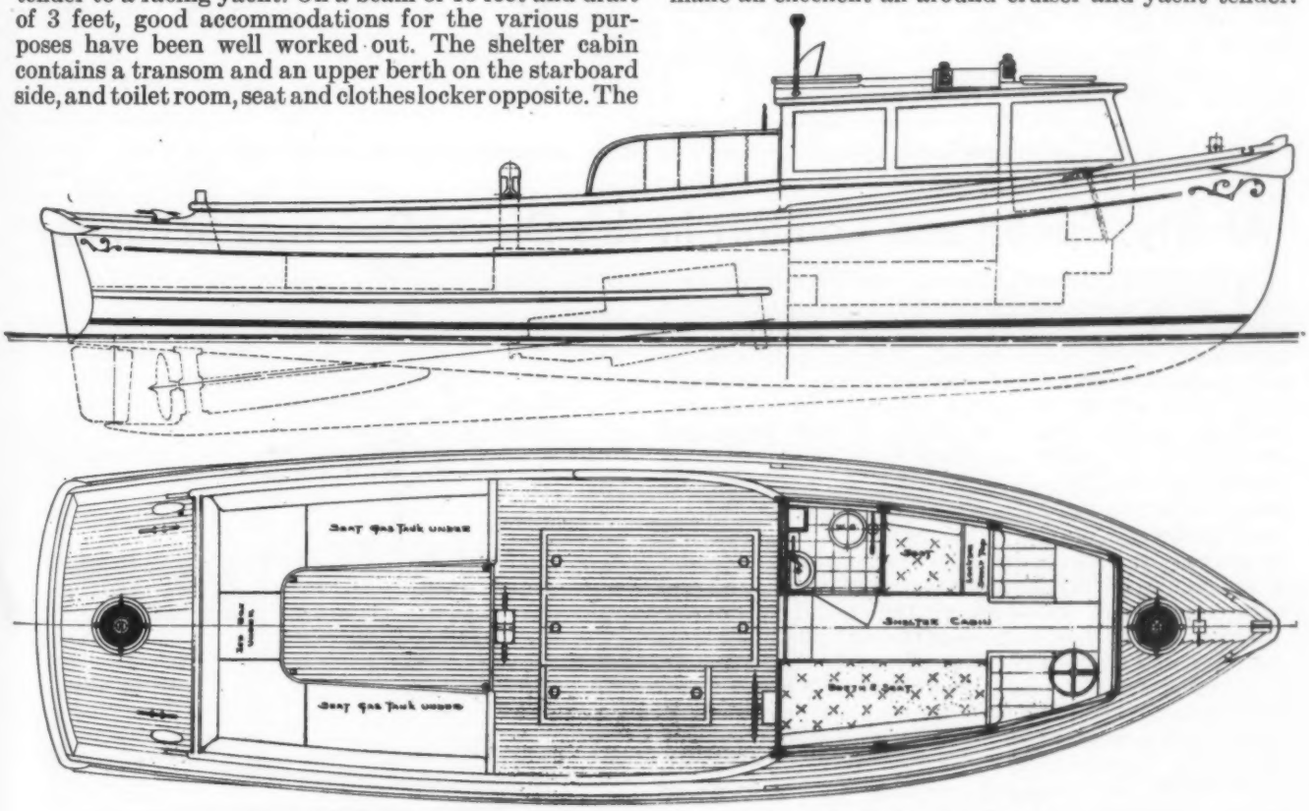
Cabin plan and inboard profile of "Dog Star," designed for W. Edgar Baker by P. L. Rhodes



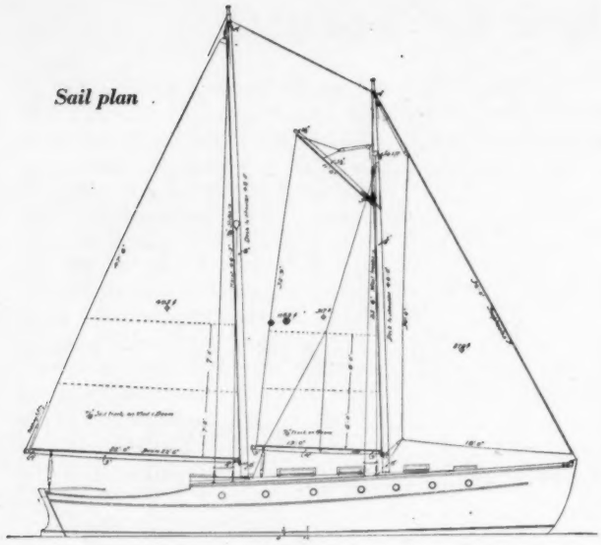
Lines, sheer and body plans of "Dog Star," designed by P. L. Rhodes, described on preceding page

A 27-Foot Launch for Day Cruising, Commuting or Towing

THE plans below, from the board of Winthrop L. Warner, of Middletown, Conn., show an attractive 27-foot launch with 100 h.p. motor which has many unusual features. She was designed for a Connecticut yachtsman whose summer home is on an island off the Connecticut shore, and is to be used as a commuter and tender to a racing yacht. On a beam of 10 feet and draft of 3 feet, good accommodations for the various purposes have been well worked out. The shelter cabin contains a transom and an upper berth on the starboard side, and toilet room, seat and clothes locker opposite. The two driving seats are forward, protected by a split-type windshield. The motor is located under the bridge deck, and is accessible through three large hatches. The cockpit is large and self-bailing, and equipped with two large towing bitts just abaft the bridge. The after deck accommodates a rowing tender stowed athwartships. She should make an excellent all-around cruiser and yacht tender.



Plans of the 27-foot launch for commuting and towing, designed by Winthrop L. Warner

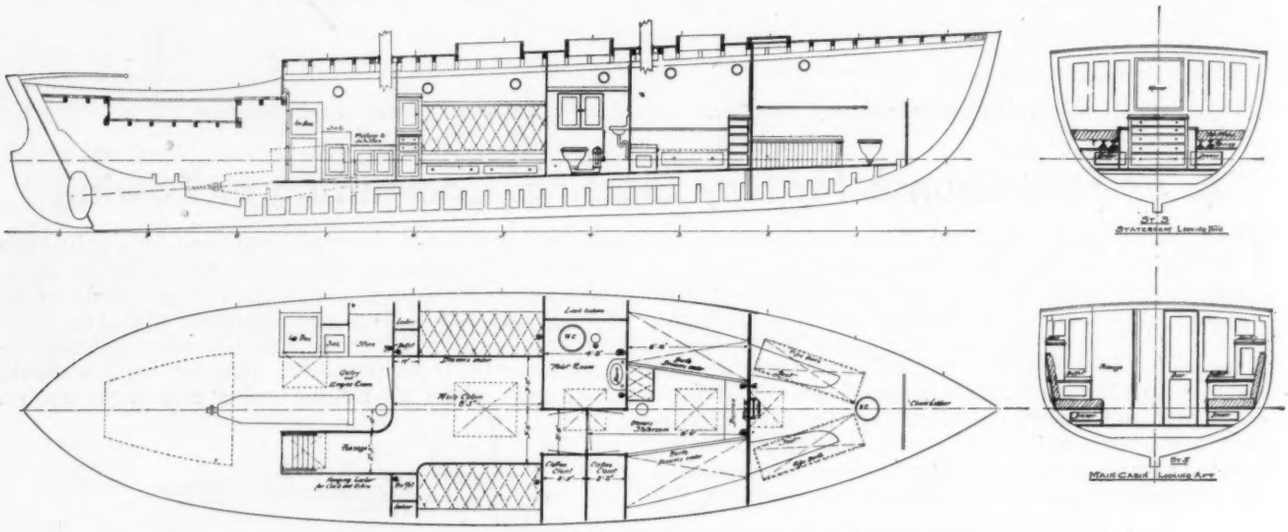


Sail plan

A "50-50" Double-Ender

AND now comes the "50–50" in a double-ender model — a remarkably roomy and able craft, with a 65 h.p. Lathrop motor for average going, and a snug jib-headed schooner rig for use when the wind is favorable. This craft is from the board of Chas. D. Mower, and was designed for cruising in West Indian waters, her dimensions being as follows: l.o.a. 55′ 3″; l.w.l. 50′; beam, 13′ 1″; draft, 4′; sail area, 1082 sq. ft.

The hull is somewhat of the whale boat type, easily driven under power or sail, with a heap of room under her raised decks. She balances under mainsail or jib, or foresail alone. There is ample room for the owner and his wife, and a couple of guests, with berths forward for two paid hands. The raised deck over the owner's quarters gives an abundance of light and air, with portlights and skylights over all compartments. The roomy toilet is easily accessible from stateroom or main cabin, and the galley and engine room are bulkheaded off from the rest of the quarters.

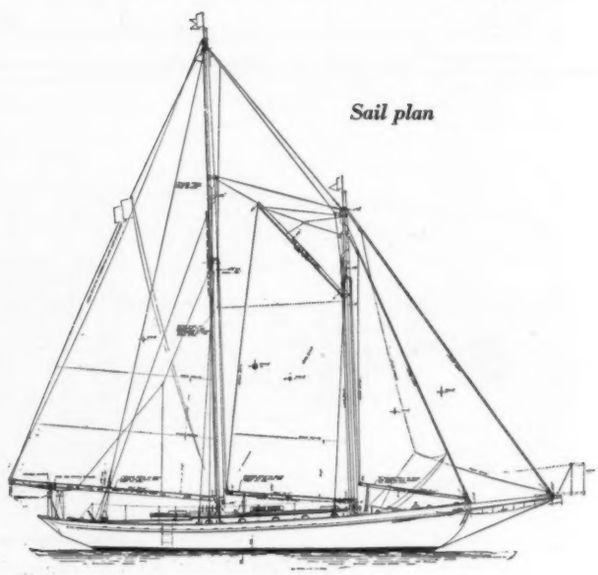


Inboard profile, cabin plan and sections of the "50-50" cruiser designed by Charles D. Mower

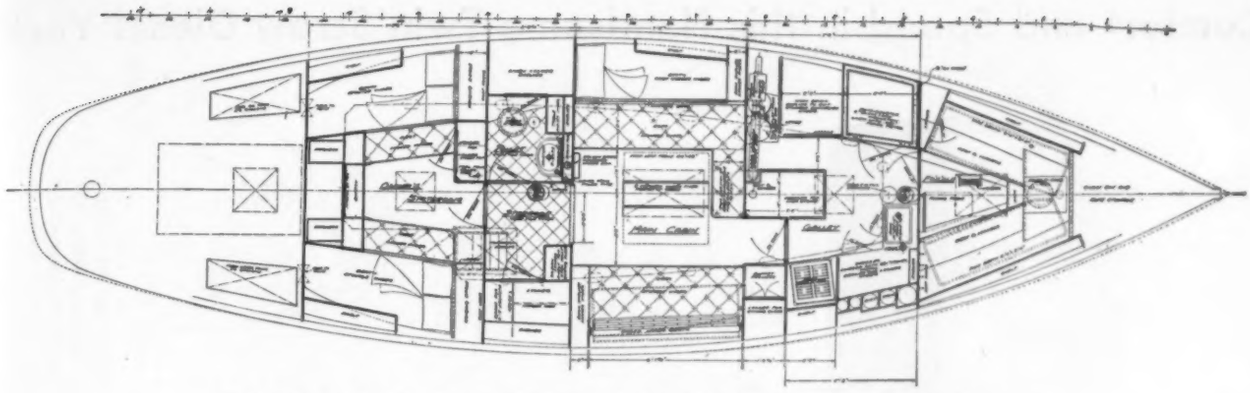
Ability, Speed and Comfort in this Diesel-Powered Schooner

MODELED along the lines of Mr. George Ratsey's *Zaida*, which has shown unexpected speed the past two seasons, the design on this and the following page, by John G. Alden, shows an able, shippy, and decidedly commodious schooner of the following dimensions: l.o.a. 52′; l.w.l. 40′; beam, 14′; draft, 6′ 11″; sail area, 1419 sq. ft. The freeboard, depth of hull, beam and moderate ends give a wealth of room for interior accommodations. The auxiliary power is a 4-cylinder Hill Diesel with 2 to 1 reduction gear, which is installed forward in the galley, thus giving an unusually fine double stateroom aft and commodious main cabin amidships. A big galley and forecastle for two men are forward, and cockpit and deck space are all that could be desired. There is over six feet headroom throughout the owner's quarters, and practically full headroom in the forecastle.

Although a full bodied, husky and able cruiser, this craft should show a fine turn of speed in all weathers, as *Zaida* took a number of larger cruising schooners completely by surprise in a number of races. As a roomy, comfortable and seagoing auxiliary with safe Diesel power, she should make a strong appeal.



Sail plan



Cabin plan of the Diesel-powered schooner designed by Alden, described on preceding page

An Improved "Dorade"—with Schooner Rig

MANY people have doubtless wondered what Olin Stephens, of Sparkman & Stephens, would do if called upon to turn out an improved *Dorade*. The answer is to be found in the accompanying plans, which show a craft quite similar in hull form to the famous ocean race winner, but with the more conventional and popular jib-headed schooner rig. The dimensions are: l.o.a. 54′6″; l.w.l. 40′; beam, 12′; draft, 8′2″; sail area, lowers, 1352 sq. ft.; displacement, 19 tons; lead keel, 18,000 lbs.

The object of the design was to produce a boat with the same characteristics which produce speed in *Dorade*, but with improved accommodations below and increased deck space, plus auxiliary power. The increased beam makes it possible to combine built-in berths and extension transoms in the main cabin, and still have good floor space. She will sleep four in the cabin, two in the stateroom, and two men forward.

Sail plan of the improved "Dorade"

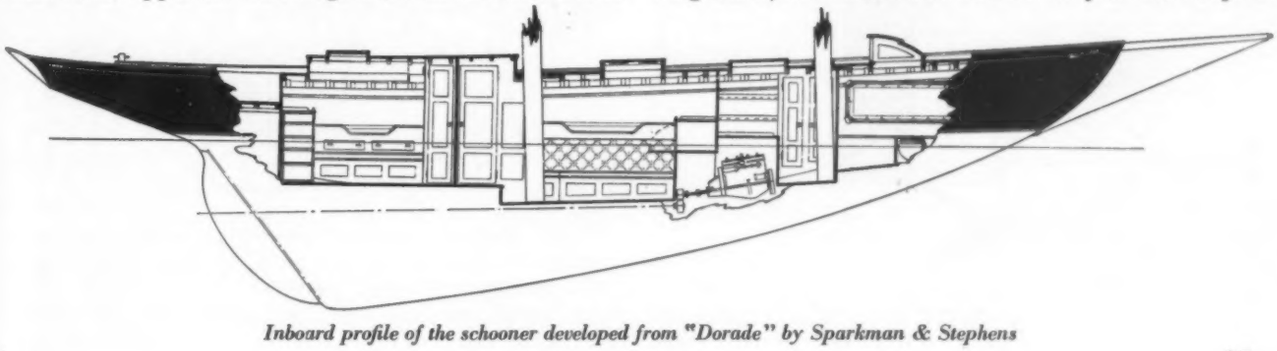
The galley, with motor installed under a dresser, concentrates the crew's work forward, and releases the after part of the boat for berths, lockers, bureaus, etc. The companionway is aft, with chart table to starboard and toilet room opposite. The large after double stateroom has a bureau and three hanging lockers. There is an oilskin locker near the companion steps. In the forward end of the main cabin, to starboard, is another large hanging locker, and writing desk opposite.

With flush deck forward of the mainmast and small trunk cabin aft, added room is gained below as well as on deck, where a dinghy may easily be lashed and still leave plenty of room for lounging or handling sails.

The motor is a Gray 4–44, with Morse silent chain reduction gear with ratio of 1.74 to 1, which should drive her 8 miles or better under power. Ample fuel and water tanks are located under the cabin floor.

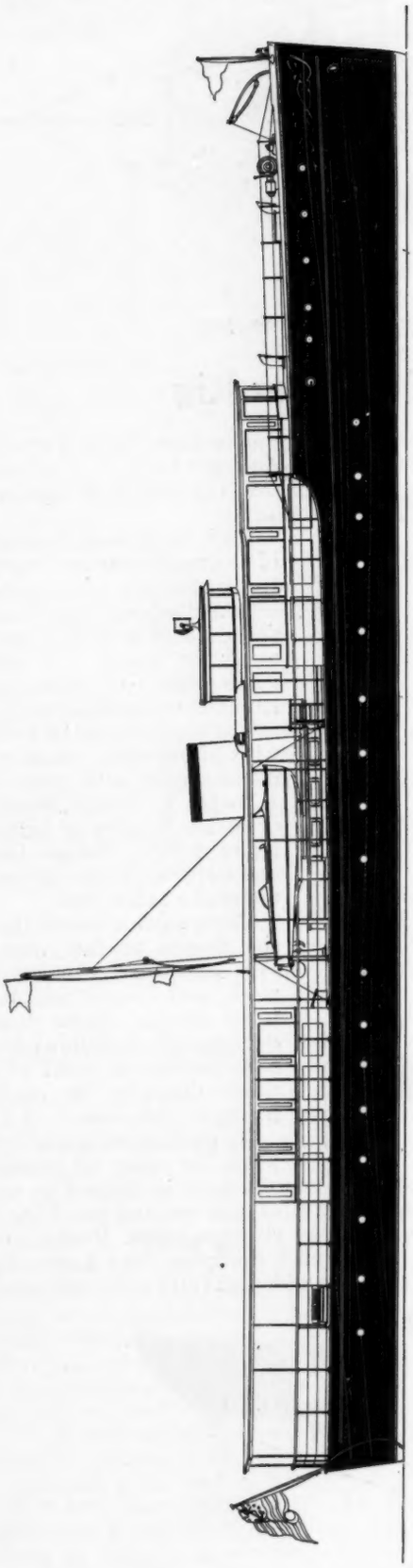
The designers believe that she should be fast under sail, particularly to windward, and should combine to an unusual degree those qualities which make a comfortable cruising yacht with those desirable in ocean racing or club runs.

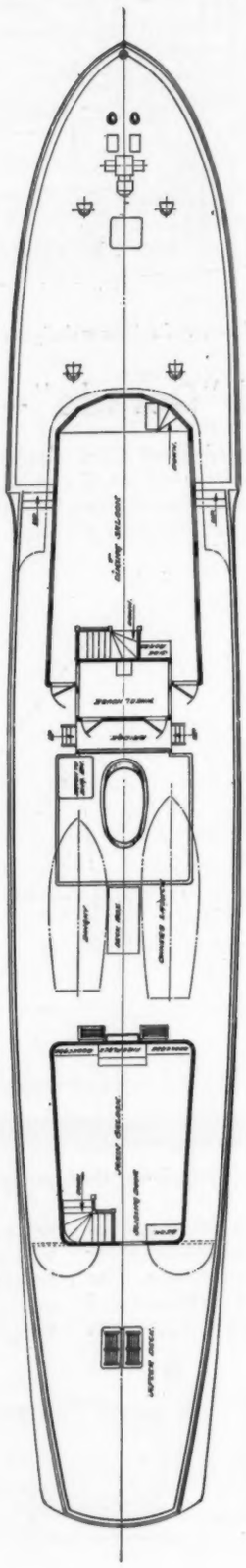
By placing the motor forward, the space aft usually set apart for a motor compartment is utilized to advantage in enlarging the after quarters and providing a better lazarette and other stowage space. Placing the water and fuel tanks under the cabin floor keeps this weight low, and results in added stability and more speed.

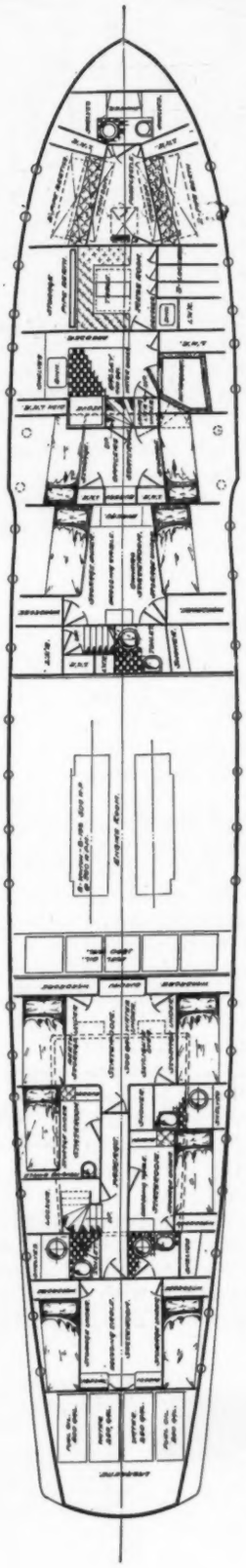


Inboard profile of the schooner developed from "Dorade" by Sparkman & Stephens

Comfort and Speed in this Handsome Twin Screw Diesel Yacht







The success of Mr. Sewell Avery's express Diesel cruiser "Lenore II" has prompted her designer, Thomas D. Bowes, to turn out a larger craft of the same general type. This 107-footer will have the same composite type of construction, with double planking, giving a light, strong, rigid hull which, with a pair of special 8-cylinder Winton Diesels, is expected to make 23 knots or better. With her fine accommodations and unusual speed, she should make a fine day cruiser, commuter, or long distance cruiser. The employment of double rudders and single arm airfoyle struts, with the propellers forward of the struts, improve the handling, especially in heavy following seas. The draft of 4 feet 9 inches is advantageous for southern cruising, and the hull is thoroughly seagoing.

Under the Lee of the Longboat

by Cap Stan

ALTHOUGH no official announcement has been forthcoming to date, it is practically certain that this year's Bermuda Race will be run under the same rule as in 1930, and not under the rule proposed to the Cruising Club by the Royal Ocean Racing Club, or any other new rule. The special Rules Committee feels that the present rule is a pretty good one, and as no boats are being built to beat it, handicaps will be quite fair, as heretofore. It is whispered that this committee has formulated a brand new rule, but will not spring it on us for quite some time, during which period they will apply it to numerous existing boats, and get designers to see if it can be beaten. Go slow, is their motto. With the thorough way in which they have tackled this perplexing problem, there seems little doubt but that the result will come pretty near being just right.

+ + +

In the past year or two there has been a great development in "double spinnakers," huge kites whose actual area is far in excess of their projected area, and which have proved to be remarkably efficient. This year will see the development of a different kind of "double" spinnaker — the "parachute" spinnaker. I've seen photographs of a couple of them in action on small racing craft in Germany, developed by Manfred Curry. From all accounts, they pull like a mule, but are very difficult to make. One of our foremost sailmakers is working in conjunction with Curry in developing these "parachutes" for use over here. Keep your eye peeled for "parachutes" next summer.

+ + +

Prophecies are pretty dangerous things to monkey with. However, I seem to be pretty safe in regard to the one I made in the December number concerning the coming popularity of the sailing dinghy. Readers of the Metropolitan Sunday papers have read all about the regattas of the Frostbite Yacht Club, when upwards of a dozen sailing dinghies of all vintages have been gallivanting around Manhasset Bay and New Rochelle. Faced with an unusually mild winter, the sailing "nuts" have welcomed the chance to get afloat, even in an 11-foot cockleshell, and found, somewhat to their surprise, that they could have a whale of a time fussing around in the "dinks." The builders are snowed under with orders already. All our harbors will be dotted with vari-colored sails next summer.

+ + +

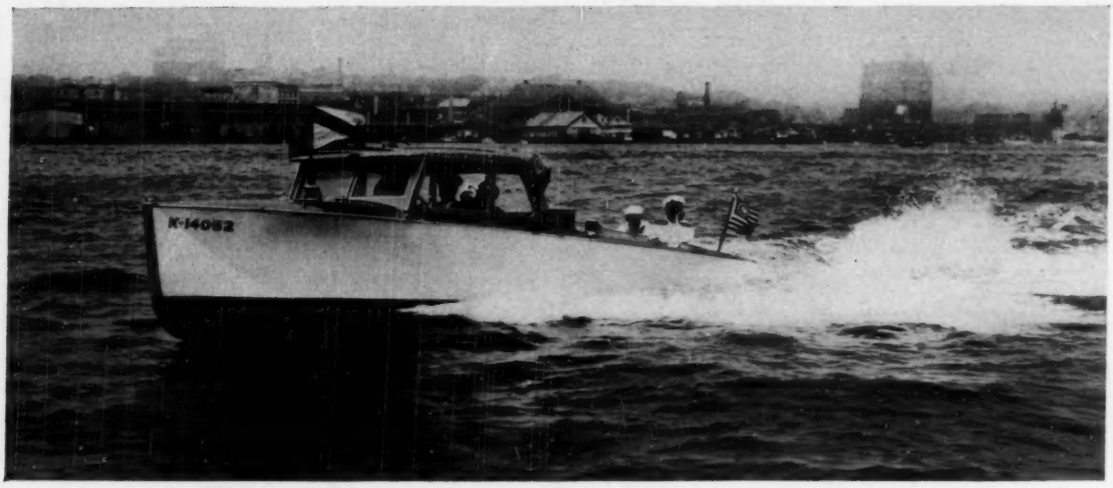
There's a new paint coming on the market, and if it lives up to the claims of the manufacturers, we've something to look forward to. Made of a pure rubber base, it is said to produce a hard, slippery, smooth surface which will last three or four times as long as any ordinary painted surface — and it's anti-fouling! Brush it on, or spray it on. Adheres to wood, metal, cement, etc. Makes wood impervious to moisture — a lighter boat for the racing shark or dinghy owner. Well, I've tried out a number of new marine gadgets of various kinds, including paints, varnishes and lacquers. Some of them work, but most of them don't. I hope this new rubber paint is the goods. But I won't be sure till I've tried it. When I have, I'll let you know.

+ + +

If you read carefully between the lines of "Starboard Tack," by Alf Loomis, in the last issue, you'll come to the conclusion that *Direction* was an exceedingly tender boat, made so by her excessively heavy construction, spars and rigging. So it's no wonder she was laid flat on her beam ends without a rag of canvas on her — no chance to fight for her life. Regardless of her great strength of hull and gear, such a craft is unsafe to go to sea in — a regular death trap, if you ask me.

+ + +

Advance indications point to a number of ocean racing craft which will be absent from the Bermuda Race this year. While we may never see 42 starters again for many moons, there will be a representative fleet on hand, despite the derelictions of some of the old-timers, for several newcomers will be on hand to fill the gaps, and Hamilton Harbor is sure to present a mighty "yachty" appearance next June.



A 40-mile-an-hour tender for W. K. Vanderbilt's new ocean cruiser "Alva." Designed and built by Gar Wood, this boat is powered with a 200-h.p. Scripps motor

Of Interest to the Skipper

Viking Sea Cruisers

THE 1932 Viking Sea Cruisers, with modern and advanced features, are the latest addition to the regular Viking line of pleasure craft which have become popular for offshore cruising and fishing. These boats, built by the Toms River Boat Works, Inc., are not a stock built production job but a semi-custom built boat. The only standardized feature is the Viking hull, the design and construction of which has proved sturdy and seaworthy.

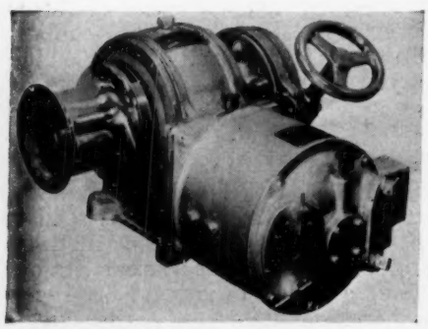
In buying a Viking, the yachtsman has a choice of a number of cabin arrangements, and has the opportunity of having his own ideas as to cabin arrangement and equipment incorporated in his boat at little or no extra cost.

The outstanding 1932 Viking Sea Cruiser will be the De Luxe Auxiliary model which has a spacious and homelike cabin with large galley and washroom. Her large after deck is ideal for fishing as well as lounging and the large forward cockpit, which is readily accessible to the cabin through a large door, facilitates the handling of ground tackle.

The sailing rig on the Viking model shown in the accompanying photograph consists of a squaresail and a jib which is a practical and easy rig to handle. The Viking sails can be set or lowered in two or three minutes. The sails are of manifold use in trolling or cruising and when if confronted with a balky engine.

Viking Sea Cruisers are built in sizes of from 24 to 36 feet and have speeds ranging from 12 to 25 m.p.h., depending on the motor selected. The price range is from $1800 for the open model, to $7500 for the 36-foot De Luxe Cabin model with Viking sailing rig.

The 1932 Viking Sea Cruisers are on display at the plant and waterfront showrooms at Toms River, N. J.



The new Hyde electric windlass especially designed for yacht service

+ + +

Hyde Electric Windlass

The Hyde Windlass Co., of Bath, Maine, well-known manufacturers of marine equipment, have developed a new electric yacht windlass to add to their line of products. These machines are compact and powerful and carefully designed to permit accessibility. They can be furnished with wildcat on either side or with two wildcats, and windlass motors for either 32- or 110-volt direct current may be installed.

These windlasses are kept in stock and delivery on any one of the different models can be made promptly. Hyde's long experience in manufacturing windlasses of every type insures the reliability of this new product for the yachtsman.

Furnans New Yacht Agency in Fairhaven

Situated at the Fairhaven end of the New Bedford and Fairhaven bridge, the newly incorporated Furnans Yacht Agency has just built a picturesque Cape Cod cottage which will house their offices and offer splendid facilities for display of their line of stock-built motor craft, cabin cruisers, runabouts, tenders, and machinery.

Among the well-known lines they represent are the Matthews and Richardson stock cruisers, Hacker, Dee Wite and Century runabouts, and Penn Yan tenders, including flat bottom skiffs and sailing tenders. The power plants specialized in are the Winton Diesel, Sterling, Kermath, Farr and Red Wing auxiliaries. A. E. Co. windlasses, Edison batteries, etc., are carried.

As the offices are situated close to the water, during the boating season the various types of craft will be shown afloat at the mooring floats and pier, where power boat service will also be available.

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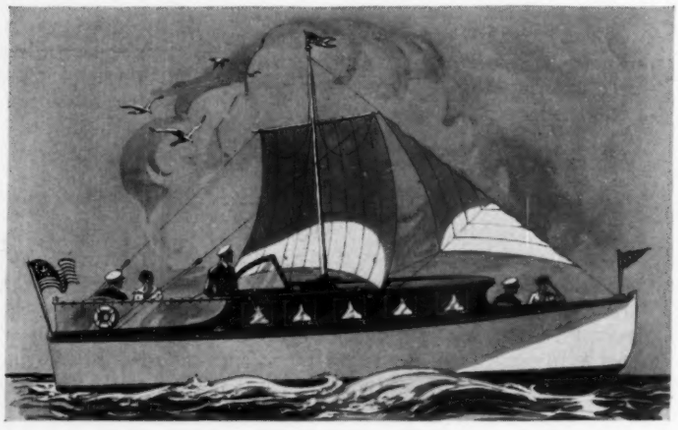
New Pyrene Fire Extinguisher Gives Increased Protection

The Pyrene Manufacturing Company has announced a new one-gallon pressure type

(*Continued on page 109*)



The new 36-foot Viking Sea Cruiser, equipped with auxiliary sails, is built by the Toms River Boat Works, Inc.

IN ADDITION to several unusual small desks now being shown at the Vernay Galleries, there is an interesting collection of Early English Timepieces, including an unique chime Clock in ebonized case by Fromanteel of London, a ship's Chronometer by Bolton Smith of Wigmore Street; also a collection of Globes and ships' Barometers.

A rare Sheraton mahogany Carlton House Desk inlaid with ebony lines, fitted with small drawers at each side of top. 1780–1790. Length 2' 11", Depth 1' 10", Height 3' 3". A George III silver boat-shaped Inkstand by Robert Hennell, London. 1784. A pair of Sheffield plate Candlesticks. 1780–1790. A George IV Silver Skewer, by R. Peppin, London. 1824.

Vernay

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LONDON, TRAFALGAR HOUSE, WATERLOO PLACE

Sterling engines were exhibited in a most effective setting

At the Motor Boat Show

(*Continued from page 41*)

A new featherweight model was presented with the well-known line of Caille Red Heads. This compact little motor weighs less than 35 pounds, delivers four horsepower, may be used in fresh or salt water.

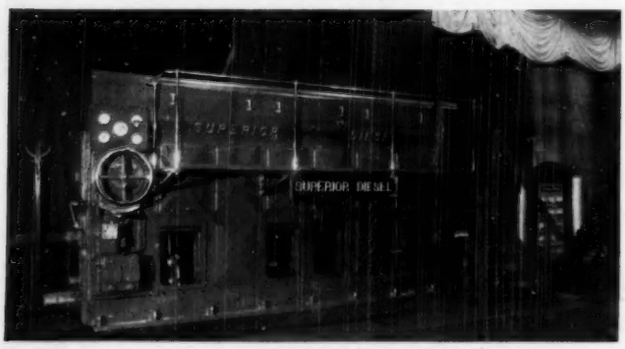
Among the Accessories

The Columbian Bronze Corporation had their usual display of popular propellers, rudders, struts, stuffing boxes, shaft logs, etc., and an improved, compact engine control. They also showed the Columbian inboard-outboard drive unit, which has proved popular the past year, giving the motor a place in the after part of the boat, an advantageous location from many angles.

Monel metal shafts and various articles of marine hardware made of this fine metal were shown at the booth of the International Nickel Co. A cut-away nickel cast iron cylinder block and crankshaft, such as used by many makers of the higher grade motors, completed an interesting exhibit.

The Hyde Windlass Co., long known as the makers of high grade windlasses, propellers, shafts, etc., had some excellent examples of their products tastefully displayed, including the Hyde feathering wheel, which has been decidedly popular for a number of years in the auxiliary field, as it greatly reduces propeller drag when the boat is sailing.

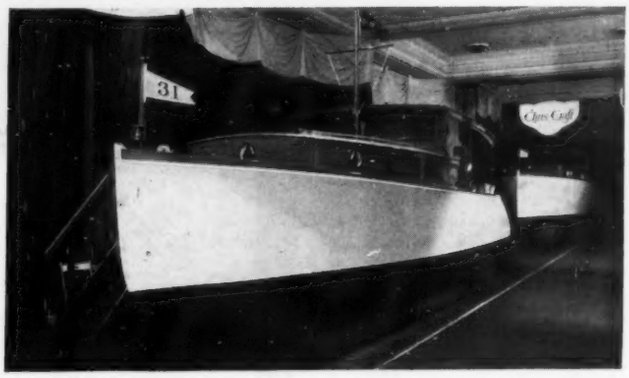
The Bakelite Corporation had a most interesting exhibit showing the remarkable wearing qualities of varnish made from Bakelite synthetic resin. Panels coated with varnishes of different grades, which had been immersed in water for long periods, showed how the products stood up under actual exposure to water and weather. Some fifty cans of varnish, all of different brands, but made with Bakelite resin, proved how many varnish makers appreciate the fine qualities of this product. Other tests showed the action of various varnished surfaces when exposed to boiling water, acids, alkalis, etc., in all of which varnishes made from Bakelite resin came through with flying colors.



The Superior Engine Co. exhibited a powerful and neat looking Diesel, with the base exposed through glass plates

Lux Fire extinguishing systems, showing the latest devices for protection against fire on all sizes and kinds of craft, were exhibited by Walter Kidde & Company in such a manner that those unacquainted with the Lux System gathered an excellent idea of how easily and surely fire could be quelled when the proper precautions were taken. A small but complete galley caught the eye of the showgoer as he strolled by Topping Brothers' booth. Alcohol stove, Kelvinator electric refrigerator, electric exhaust ventilator, new type water pump, and all the other fixings of a well-equipped galley were there. Topping also had a comprehensive line of excellent marine accessories and hardware of all varieties.

Besides a fine line of compasses, binnacles, sextants, and other navigating equipment, Kelvin & Wilfrid O. White showed for the first time the new model of the Kenyon Speedometer and the Kaess Portable Radio Compass and Direction Finder. The Kenyon Speedometer now shows not only the speed of the boat, but the mileage covered, just as a log does — in fact, it duplicates the performance of the speedometer on a motor car, and may be used on either sailing craft or motor boats. The Kaess Radio Compass is a compact, portable affair, beautifully made and finished, and is a valuable, up-to-the-minute adjunct for navigating.



The Chris-Craft 31-foot and 36-foot single cabin cruisers

Goodrich Cutless Rubber Bearings for shafts of all dimensions were attractively displayed in the Goodrich exhibit. These rubber bearings have so thoroughly proved their value in reducing vibration and friction in propeller shafts that the majority of stock boats are supplying them as standard equipment. Rubber bearings were in evidence at the show on stock boats too numerous to list here.

The bearings are sold in bushing units which may be inserted in existing stern bearings, provided inlet water holes are bored to introduce a flow of water through the bearing, thus insuring water lubrication. The coefficient of friction of wet rubber on metal is very low and that is the reason there is less power lost in friction when using the Goodrich bearings. And with the decrease of friction there is an increase in the life of both the bearing and the shaft. Rubber bearings ordinarily last five times as long as metal bearings.

A few years ago a rubber bearing was a novelty, but now it is an accepted accessory on speed boats, runabouts and cruisers as well as on commercial vessels.

Photos by Morris Rosenfeld

Varnishes that provide genuine protection for deck-houses and trim

Lashed with spray, drenched with rain and baked by burning sun, exposed wood surfaces of deck-houses and trim, and canvas covered decks and cabin tops require exceptionally durable finishes. Frequent washings with strong soaps call for varnishes that will successfully resist alkalis. Chance blows and constant wear present the need for finishes that are tough and elastic.

All of these properties are combined to the greatest degree in finishes made with Bakelite Synthetic Resins. In addition, these varnishes and other finishing materials dry more rapidly than others, have greater covering power, yet are remarkably easy to apply. Owners and operators of sail boats and motor cruisers will find the use of these varnishes a real economy both in service and in refinishing.

Bakelite Synthetic Resin varnishes are by no means confined to use on deck-houses and trim. There are finishes for practically every wood and metal surface, spars and riggings, top sides and bottoms, inside and out. All of these possess the same exceptional durability and water resistance and each one is developed to best perform the service required of it.

Write for our illustrated folder 20V which fully describes the properties of finishes containing Bakelite Synthetic Resins, together with the names and addresses of the many manufacturers. It also contains several reports of interesting applications under actual service conditions. The next time you refinish, ask your paint and varnish supplier for these finishes.

BAKELITE CORPORATION, 247 Park Ave., New York...635 W. 22nd St., Chicago

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Comparisons are glorious . . . .

to owners of this new 38-foot Combination Sedan "PLAYMATE"

As originators of this exceedingly popular type of all-around cruiser, naturally we offer you refinements and exclusive features that are denied owners of imitative craft. To be specific — for that is what counts — the owner of a WHEELER 38-foot Combination Sedan "Playmate" enjoys

1. Direct access through the boat from stem to stern. No catwalking crab-fashion around a narrow deck.
2. Unbroken floor space in sedan compartment permitting arrangement of wicker chairs to suit every occasion.
3. Two wide comfortable extra berths in the airy sedan which disappear completely when not in use.
4. Lavatory conveniently accessible from all parts of the boat.
5. Engine compartment is completely insulated.
6. Prices which give that inward glow of satisfaction at having secured the most boat — and equipment — possible per dollar invested.

The 1932 model has been lengthened a full foot and a half, yet prices have been reduced substantially. Send for floor plans and other details of this splendid little yacht, ideal for ocean or harbor cruising, whether single-handed or with a party of eight.

If you're thinking of a larger or smaller boat, there's a 1932 WHEELER "PLAYMATE" for just your needs. From 23 ft. to 70 ft.; some with diesel power; all with that unmatched WHEELER ruggedness and distinctiveness at prices representing equally unmatched value.

WHEELER SHIPYARD, INC.
Foot Cropsey Avenue, Brooklyn, N. Y.

WHEELER PLAYMATES

The 1932 Catalog B is ready for your careful study. Send for your copy today.

Yachtsmen vs. Fishermen

(*Continued from page 58*)

the number of yachts lost is that all fishermen, the year round, have to go out and take things as they come, gales, ice, fog, calms and tides. Among yachtsmen, only the more seaman-like willingly face these conditions, and only for short periods.

Then, too, there is the fact that while your old-time fisherman depended on sail entirely for his living, his safety, and his ability to get his catch to market before gangrene set in, there is today not a single strictly sailing vessel fishing out of Gloucester. This includes the *Thebaud* when she is working at her trade. In Lunenburg things have not gone that far, but they are on their way. That's why the men who do the thinking aboard the Gloucestermen are gray under their sou'westers. The younger generation simply do not know sail, unless they have learned in "yachting."

It's all a matter of purpose and occupation. A yacht in which everything is sacrificed to speed would make a mighty poor fisherman, and a fisherman has to sacrifice, to her trade, certain qualities that make for extreme speed. A man who spends all his time figuring how to make a living in the fishing business (no cinch these days, they tell me) hasn't time to bother with the ultimate refinements that give the racing yacht her few-seconds margin of victory, and a man who spends all his time figuring out how to make his boat a second-a-mile faster won't catch many fish.

As a matter of fact, most fishermen, I have found, are as quick to admit this as the yachtsmen are, and well they may be, for the balance is in favor of the fisherman. Any good fisherman can make a living as sailing master of a yacht, but how many yachtsmen could go out and make a living as master of a fishing vessel?

If "Belle Isle" wants to settle the argument once and for all he can have some good yacht designer turn out for him an ocean-racing schooner of the *Bluenose's* length, based on the lines of successful ocean racing yachts, and get one of a dozen yachtsmen I can suggest to sail her in a race against *Bluenose* and her Lunenburgers. "Belle Isle" had better not command her himself. He is right, perhaps, that it does not take any more science to sail a yacht around a race course than it does to steer a toboggan, but any fisherman can tell him that there's a difference between just sailing around the course and winning the race.

Propellers

(*Continued from page 53*)

is always measured as a percentage of the advance which the propeller would make if it advanced its full pitch for every complete revolution.

Taking one minute as the basis upon which to make the calculation for slip, the amount which the propeller would advance in that minute if it did not "slip" can be found by multiplying the pitch in inches by the r.p.m. and then dividing that product by 12 in order to change it into feet per minute. This is sometimes called the theoretical speed of the propeller or the speed for "zero slip." But the boat, and consequently the propeller which is a part of it, does not go ahead that much. The speed of the boat in feet per minute is easily found by multiplying its speed in miles an hour by 88. When subtracted from the theoretical speed of the propeller, this leaves an amount which tells just how many feet the propeller slips in a minute, and when divided by the theoretical

3rd Annual St. Petersburg-Habana Race
April 16th 1932

IT STARTS HERE! IT ENDS HERE!

Left — St. Petersburg's Recreation Pier; right — Morro Castle, Havana; above — map of race course.

The South's Great Salt-Water Classic
Don't Miss It This Year

TWO YEARS AGO a fleet of blue-water windjammers gathered at St. Petersburg and answered to the starting gun of the first annual St. Petersburg-Habana Race, which was repeated last year! And what sea-goin' parties they were! . . . It has become an annual habit and the start of the 1932 event, Saturday, April 16th, will close the winter yachting season on sunny Tampa Bay. . . . If your ship is in southern seas, cruise to Tampa Bay and join the party!

For further details and entry forms, write the—

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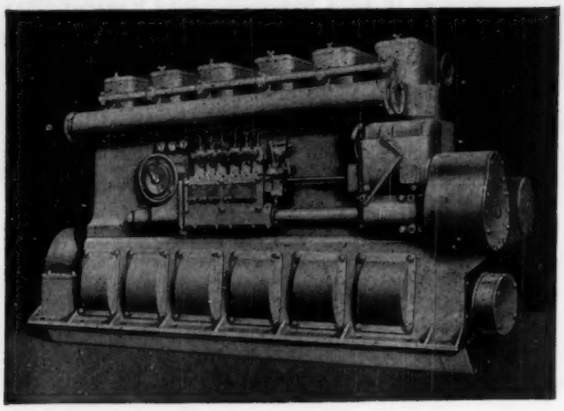

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12½" bore x 18" stroke
12½" bore x 20" stroke
12½" bore x 22" stroke
16" bore x 20" stroke
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*All obtainable in 6-cylinder and 8-cylinder construction. *These three sizes in standard iron or special aluminum construction, the latter for light weight and higher speeds.*

THE above series, consistently designed for maximum standardization of parts, smooth care-free operation and high economy, offers the desirable unit capacities up to 1600 h.p., operating speeds up to 600 r.p.m. and right and left construction for matched pairs in twin-screw vessels.

Low head room, short over-all length, moderate weight, easily cleaned exterior and readily accessible internal parts, and low running costs — all are inherent characteristics of this series.

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Division of American Locomotive Company
Exclusive Yacht Representative:
EARL H. CROFT
2800 Chrysler Building New York City

speed gives the percentage of slip. Combining all constant factors and putting them into a formula which may be worked easily and quickly by any one who is familiar with the slide rule:

$$\text{Slip percent} = 100 - \frac{105600 \times \text{boat speed}}{\text{pitch} \times \text{revolutions}}$$

where the boat speed is in miles an hour, pitch in inches, and revolutions per minute.

In most boats the slip is seldom less than 15 percent and may run as high as 40 percent when a high-speed motor is installed in a heavy hull. The greatest efficiencies are found when the slip is in the neighborhood of 15 percent and that is a very good figure to try for. Luckily, the efficiency of a propeller does not drop off rapidly as the slip increases. The accompanying curve shows how the efficiency of a three-bladed propeller with a pitch ratio of .8 changes with the slip. This curve, which is taken from experiments made by Admiral D. W. Taylor in the U. S. Naval Model Basin, shows a maximum efficiency for this particular propeller of about 67 percent when the slip is 15 percent. Increasing the slip to 24 percent reduces the efficiency to 65 percent, while a slip of 30 percent still gives 62 percent efficiency. This curve has the general characteristics of all efficiency curves although the maximum efficiencies are greater for propellers having higher pitch ratios.

The following instalment, in the March issue of YACHTING, will cover the relation between speed, pitch and slip and give the methods of ascertaining the proper wheel for boats of various types and speeds.

(*To be continued*)

Rudders

(*Continued from page 68*)

Many factors control the size of the rudder blade, prominent among them being speed, to which the size, as a rule, is in inverse proportion. But a rudder which is right for a boat at top speed is too small to make her thoroughly maneuverable at low speeds and in crowded mooring grounds. So, for the most part, the rudder, to meet all conditions fairly well, must be a compromise in size. It is interesting to note that, in general, smaller boats require much larger rudder areas in proportion to their size than do larger vessels. And boats with keels, skegs or struts, require larger rudders to overcome the resistance of these fixed flat surfaces to the wide movement of the stern in turning.

A neat effort at obtaining additional push for a racing boat by a specially designed rudder has been frequently made by one leading designer. This is an adaptation of the "contra-propeller" used with great success on large ships, but on them the stern post is utilized instead of the rudder. It will be remembered that the volume of water from the propeller comes aft to the rudder in a twisting stream. It is apparently possible, therefore, to shape the rudder blade in such a manner that aid instead of resistance results. Since these streams of twisting water are inclined at an angle to the center line of the hull, advantage can be taken of this inclination by shaping the rudder to catch the stream and deflect it aft so that there would be a forward or driving component in a manner exactly similar to that of a sail driving a boat to windward. This means that that part of the rudder above the hub of a right hand propeller would be concave on the port side, and that part of the rudder below the hub would be concave on the starboard side. And for a left hand propeller, the reverse would be correct. Just what

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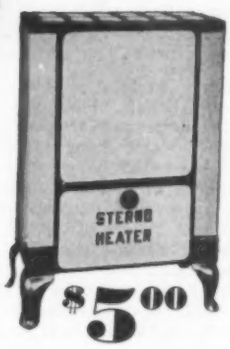
STERNO CABIN HEATER

Here's a heater that has no temperament. Warms up average cabin in 10 to 15 minutes. Invaluable when there's a nip in the air . . . safe . . . compact. Stows away when not in use. See it at the Show! Also standard equipment on leading cruisers. Only $5.00!



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Please send me postpaid with the understanding money will be refunded if I'm not satisfied:

☐ Sterno Galley Stove at new low price of $10.00

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SHOAL DRAFT

Shoal draft boats are increasing in popularity. We have built over thirty in the past four years, all of them cruising boats, varying in size from 30′ to 80′ overall, and all using the centerboard.

What are the advantages? One, obviously, is the shoal draft. It opens up many harbors closed to the "long-legged" boat. It often permits mooring close to the owner's house, where a keel boat would have to be moored well out from shore.

The shoal draft boat may be driven faster under power than the keel boat, a characteristic that the average man likes. It is naturally beamier than the same size keel boat, giving a lot more room inside.

Some yachtsmen object to a centerboard. Generally, I think this is because they believe the shoal draft boat is less able. These critics have not had experience with modern designs, or they would change their minds. A test of one of our 43′ centerboard boats shows that it must be heeled over to an angle of 95° before it reaches a danger point — which means that the masts and sails would have to be under water.

Modern centerboarders have most of their ballast outside, the same as a keel boat. I am recommending them for average use only — not for extended ocean passages, though plenty of them do it.

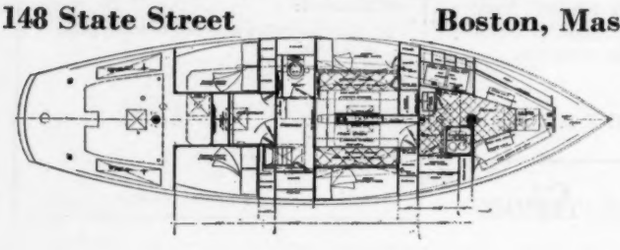
Some men say they don't sail as well. On the wind I will agree that in most cases, the keel boat will point a little higher. However, you will find that actual difference in speed to windward is small. Nowadays, few people will make a long thrash to windward. They use the motor. Off the wind, the centerboarder will beat the keel boat.

The sketches here show a 46′ overall ketch, now under construction. Water line is 35′ 10″ and beam 13′ 3″. Her draft is 4′ 6″ with centerboard up, and there are 9000 pounds of outside ballast. Excellent accommodations include a large after stateroom with two double berths. The very roomy main cabin has two built-in berths and two extension transoms. Forward is the galley and forecastle for a paid hand.

As we have had considerable experience in designing this type of yacht, may we talk it over with you? It is not too late to build. You will be surprised at the price. One or two excellent boats of this type are available secondhand.

JOHN G. ALDEN

148 State Street Boston, Mass.



amount of push can be thus obtained is not known; little, no doubt, but it is appreciable, and superiority among racing boats is often determined by such fine points.

The bow rudder is still an unsolved enigma. It is of no value except on extreme hydroplane types. A bow rudder acts in a manner exactly opposite to a stern rudder. It forces the bow in or out and the stern merely follows along. And whatever pressure there is on a bow rudder does not promote banking, but tends to prevent it. Therefore, bow rudder boats do not bank on turns.

The "feel" and action of a bow rudder boat is entirely different from one with the rudder aft. The driver gets the impression that the boat is not under control. The stabilizing effect of the after rudder is absent, too. The bow rudder is always made in a trailing form and, despite this apparent lack of balance, gives surprising response to a little yank on the steering wheel. A novice is likely to turn it too far while passing through broken water, and when it takes hold the boat may give a quick swerve and capsize.

One of the problems of the bow rudder is to keep it in the water, or enough of it to be effective at all times. It should be located well forward and could even be in the nose if it could be kept in the water. The farther forward it is the more effective — and the greater the difficulty of keeping it sufficiently immersed. Whenever used, the bow rudder should be accompanied by a stout skid fin to stabilize the stern as it follows the path of the bow on a turn. The resistance of this fin on a turn is not nearly so great as that of a strut of the same side surface with a stern rudder. The difference is that the stern rudder pushes the stern sidewise to turn the boat, and the bow rudder leads the boat around by pushing the bow sidewise.

While most of these observations concerning after rudders apply to some extent to boats in general as well as to high-speed types of runabouts and racing craft, the bow rudder appears to be limited, according to the present outlook, to exclusive use in the latter. The most prominent bow rudder boat in this country is *Miss America IX*, which has a tiny bow rudder about the size of a post card — four by six inches in measurement — for controlling that 8,000-pound boat at 100 miles an hour. The twin installation, however, aids materially in maneuvering this finely balanced monster.

"The Gentle Art of Quitting" from Another Angle

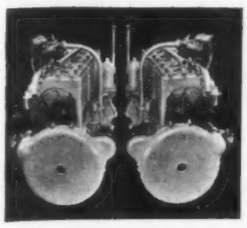
(*Continued from page 76*)

realize that most of us do not have the time and money for dream ships, but must take the best we have with enthusiasm and use discretion when the old tub begins to leak and carry away gear. Quitting is humiliating enough without your efforts to rub it in. If we carried on like damn fools with disastrous consequences, your pen would be the first to burn in condemnation. No matter which way we turn you can find a way to make a good story out of us.

While it is a foregone conclusion that the average yachtsman enters a distance race with the intention of finishing, it does not seem extraordinary that many must enter knowing that they may be unable to do so. Those entering with this possibility are willing, I am sure, to acknowledge it with perfect frankness, feeling that their obligation to the Race Committee in charge and to other contestants is fulfilled when they have made every effort to finish that their circumstances allow.

"Why do we enter these tubs at all?" you may ask. Because we love it. Why is it that so many "quitters" come back year after year? If we all waited for our dream ships before entering

SCRIPPS *the Engine that lets you Forget!*



Power and dependability! That's what you buy in a SCRIPPS engine. Power to take you there, and bring you home again. Power that jumps into action at throttle-touch. Power that is faithful—mile after mile, day in and day out.

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SCRIPPS power plants are either standard, or optional equipment in all good boats. Specify SCRIPPS when you buy your boat.

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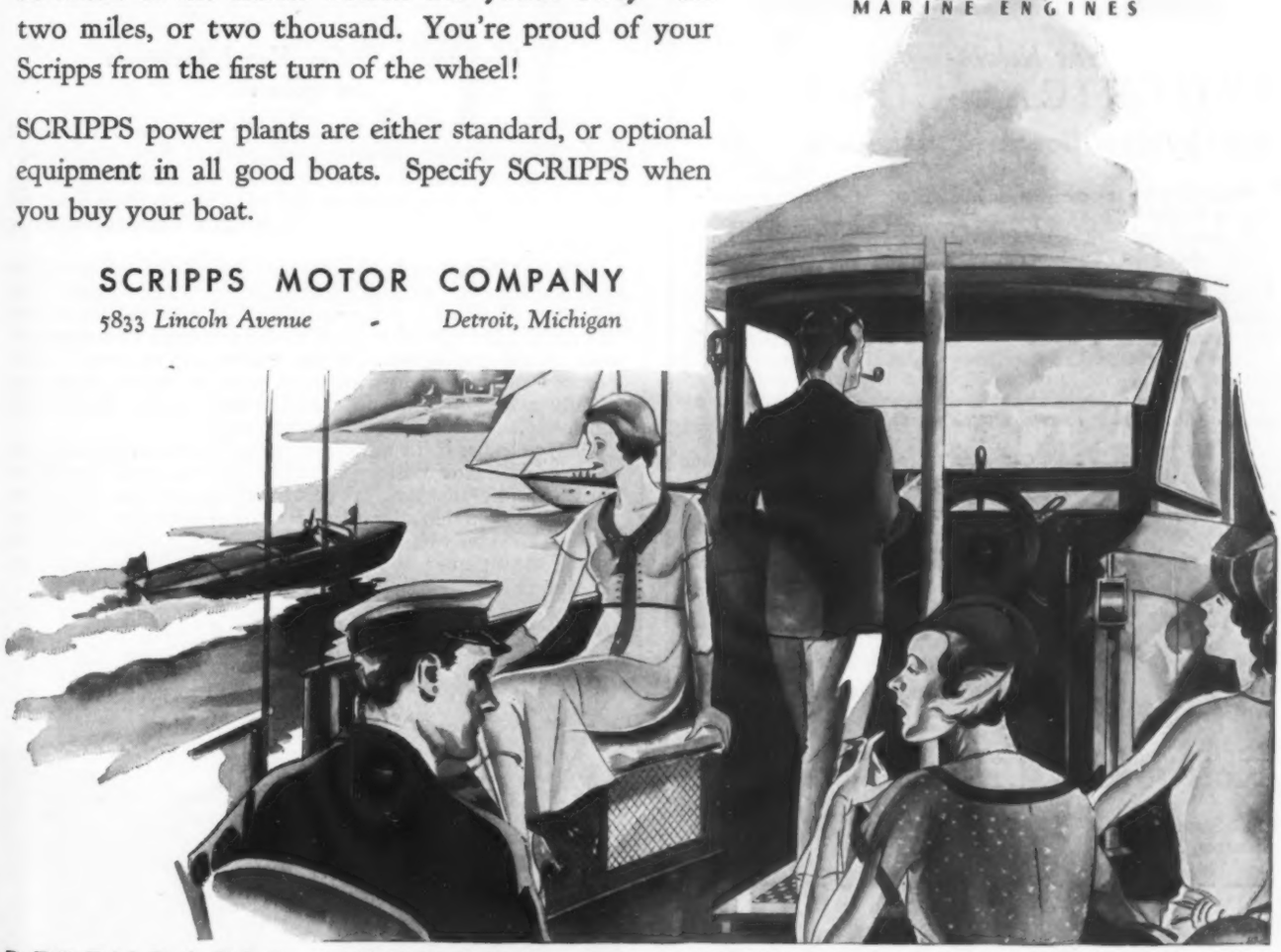

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There's a SCRIPPS marine power plant for every hull requirement from the 15 foot runabout to the 100 foot cruiser—27 models including the popular Scripps Mated Twins — high speed, or medium speed in direct drive. Write for catalog, specifications, and price list.

PROVED SUCCESSFUL IN TRANSATLANTIC RACE

The Kelvin-White

SPHERICAL COMPASS

liked by all on board the "Highland Light"

A rugged test for any compass, and here is what the racers reported. Dudley Wolfe — "The Compass proved to be very successful. It was easy to read and very steady in rough going. We all liked it very much." And John Parkinson reports — "I liked your new spherical compass on the "Highland Light" to steer by better than any I have before used. It was very steady and the compass points were very plain through the globe. Also, you could have the top off the compass in wet weather and water did not stand on the top of the glass."

Outstanding features are: a perfectly spherical bowl that rolls and pitches with the motion of the ship yet does not restrict the free motion of the card, or disturb the liquid; a glycerine-ballast damping chamber that assists in producing a steady card in the roughest weather; automatic magnification that permits easy reading even from a distance; an unusually lightweight card and improved magnetic system that makes the card deadbeat and eliminates overswing; a simplified Azimuth circle.

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Please send me your free booklet on your new spherical compass.

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races there might be more finishers, but certainly fewer skippers than there are today.

The man who loves and follows the sea also loves his ship, and therefore is inclined to open himself to the charge of quitting rather than blame it on her. Because by heroic persistence you "Sewed Your Way to Cornfield" you apparently assume that the rest of us could do the same when what we needed was a loom to manufacture whole cloth.

You regard the call to business with suspicion, not realizing that employers are not as well educated in the vital importance of yacht racing as yourself, and that while a knock-down, drag-out race means a marketable story for you, it may result in the loss of jobs for others. It is a hardy sailor, indeed, who returns to his desk a day late and explains his absence by the necessity of negotiating a fifty to one hundred mile course regardless of calms or gales.

It would be too bad if we all finished every race, for then you would be deprived of the glory of marching homeward, combing the salt out of your beard and blasting that "90 percent of the starters quit and I was the 10 percent," and it would not then be possible for you to collect cash to buy new sails on the acceptance of humorous stories about a lot of us who feel that your article should have appeared under the title of "The Gentle Art of Bragging."

SEWARD DEHART

\+ + +

Megargel & Gruber, Naval Architects and Brokers

ON JANUARY 14th the recently incorporated firm of Megargel & Gruber opened offices at 11 West 42nd Street, New York City, for the purpose of carrying on the business of yacht brokerage and designing. Both of the principals have had long and wide experience in the designing, selling and chartering of yachts.

Ralph G. Megargel has for the past few years been associated with the firm of Cox & Stevens, New York, in charge of the sailing yacht division of the brokerage department. He is thoroughly familiar with all types of yachts and has a wide acquaintance among yachtsmen. He has taken part in many of the Bermuda and other long distance races of recent years, and usually manages to be up near the head of the fleet at the finish line.

Henry Gruber is the naval architect of the firm. He, also, was recently with Cox & Stevens, and before that with the firm of Burgess and Donaldson. While with the latter firm, he worked on the last Cup defender, *Enterprise*, and helped to design and test out the many changes in that yacht's rig which were tried during the summer of 1930. He is thus familiar with modern practise in the designing and rigging of sailing yachts.

On a Dutch canal. From a drawing by K. Lensselink

CHRIS-CRAFT ANNOUNCES

TWO NEW CRUISERS

31 36

FEET FEET

Chris-Craft offers for your inspection two new cruisers of 31 and 36-foot length, embodying every modern feature that could contribute to the comfort and satisfaction of owners.

Not only do these boats present a finer outward appearance, but interiors are of entirely new design. Their roominess is surprising. Fittings are luxurious, both inside and out. Extreme head room is provided. Cabin and cockpit arrangements will delight those who appreciate the extra conveniences and niceties of life afloat.

Hulls, of course, are of accepted Chris-Craft design, seaworthy, durable, dependable. Both models are powered with marine motors of the latest type; they are faster, smoother and easier to handle.

With the 38-foot Custom Commuting Cruiser and the 34-foot, 42 m.p.h. Commuter, these new 31 and 36-foot Chris-Craft complete a cruiser fleet that offers the finest performance and greatest values in Chris-Craft history. See them at the New York Show . . . or use the coupon to bring complete information.

CHRIS-CRAFT CORPORATION—402 DETROIT ROAD, ALGONAC, MICHIGAN
NEW YORK DIRECT FACTORY BRANCH—1 WEST 52ND ST., AT 5TH AVENUE

Some desirable Chris-Craft sales territories are available

Chris-Craft

RUNABOUTS • SEDANS • COMMUTERS • CRUISERS • YACHTS • TENDERS

C-C Corp., 1932 [140]

COUPON—CHRIS-CRAFT CORPORATION, 402 DETROIT ROAD, ALGONAC, MICHIGAN

☐ I am interested in further information regarding the following cruiser models ☐ 31-foot, ☐ 36-foot, ☐ 34-foot Custom Commuter ☐ 38-foot Commuting Cruiser

Name_____ Address_____ City_____ State_____

No Kidd-ing, Captain! Here are Treasures!

YOUR guests afloat may think the Port side is where you stow your wines—but they know what's what in trim tableware! They'll judge your yacht by the charm of its china and the cast of its crystal. By all means be correct! Furnish your table at Ovington's and you'll be both correct and nautical!

OVINGTON'S

Yacht China, Crystal, Silver, 3rd Floor

437 FIFTH AVENUE, NEW YORK

China Service for six with two enamel flags, 37 pieces, $45. Yacht weight crystal, 6 highballs, 6 tumblers and 6 cocktail glasses, $29. Silver service, 31 pieces, $25.

"Mahdee"

(*Continued from page 61*)

addition to the propulsion motor, is a service motor for pumping bilges which has a sea connection for hosing decks.

The cockpit is carried the full width of the ship out to the rails, and is self bailing. The criticism of the wide cockpit shown is that it would hold a lot of water if a sea came aboard. According to George Doane's experience in the *Sea Lure* going to Bermuda with the same kind of cockpit, if a sea breaks aboard the weather is so rough that most of the sea rolls right out again. It was because of opportunities to sail in *Sea Lure* over three years that the sliding gunter rig was chosen for *Mahdee*.

A proper awning to make the cockpit livable at anchor in wet weather and so increase the apparent size of the vessel has certain novel features. On each side of the gallows frame which supports the boom is an arm which swings out to secure the after corners of the awning outside the line of the rail so that rain drips clear. The awning is suspended by ordinary mast slides from a track on the under side of the boom, extends over the deckhouse to prevent water from driving in from forward, and the two forward corners lash with lanyards to the main shrouds at any height desired. Thus the whole awning is held rigid and silent.

The sail area of the four lowers is 1500 square feet, just about what you would expect a hull of this displacement to carry with a single reef down all 'round. I wanted a short rig because I was willing to sacrifice speed to comfort and did not want to have to trouble to reef to be comfortable. The result is that *Mahdee* is dull in light airs but quite unexpectedly snappy in a reefing breeze. Her stiffness is indicated by the fact that she has never had her deck under water although she has logged as high as 9½ knots on a reach and has sailed from Portland to Gloucester in 9½ hours.

The foremast is a hollow spar built 'round a 2½-inch copper tube with an air space 'round it which carries the exhausts out just beneath the truck at the masthead. The foresail is orthodox and is equipped with a vang, or fore gaff sheet, which trims to the mainmast and leads down to the deck. When this is trimmed on the wind the fore boom is lashed down to a ring bolt with a watch tackle. This takes the twist out of the sail and makes it much more effective. It also makes possible carrying the fisherman longer because it may be set outside the foresail.

The advantages of the sliding gunter mainsail are in having the shape and size of a Marconi sail with a short mast which needs no spreaders. There is, therefore, a minimum of chafe to the sail. Mast hoops are used so there are no slides to jam if the sail has to be lowered while running off the wind; furthermore, there is the weight of the gaff (or "yard" as I believe it is correctly called) to bring the sail down on the run. The short mast reduces windage considerably when going to windward under power alone, and saves top weight as well. In fact, I have found no disadvantages. The sail seems to set as well as the best of the true jib-headed sails. There is a wire luff rope shackled to the bottom of the yard so that when the wire halliard is set up the whole business is taut. Next summer I plan to use a single part chain halliard as recommended in "Yachting Monthly," with a small windlass at the foot of the mainmast set over a box to house the chain on deck.

The outhauls on all three booms are the same — a wire lace line secured at the forward end, leading through eyes to a cheek block at one side of the after end of the boom, thence over the top of the boom through the block of regulation outhaul fitting which slides on a short length of track, thence aft again to a cheek block on the

On Senator Metcalf's Yacht, this A-E-CO Windlass

A-E-CO Windlass
Type "T"

YOU know men by the company they keep. The same is true of machines. Here is a windlass fit for a Senator's yacht . . . Note its trim beauty, its compactness. An A-E-CO windlass has power and strength without clumsy bulk. It fits conveniently into the bow of a boat and occupies little deck space. Naval architects and boat builders know its reputation for reliability . . . and there is a type and size for any boat that needs a windlass.

Write for literature describing

A-E-CO AUXILIARIES

Windlasses
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Steerers
Chain Stoppers
Winches
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Anchors

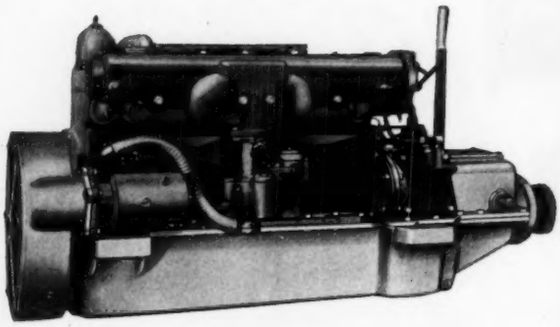
"The Felicia," Mr. Jesse H. Metcalf, owner. Designed by Gielow

AMERICAN ENGINEERING

AMERICAN ENGINEERING COMPANY, 2432 ARAMINGO AVENUE, PHILADELPHIA, PA.

Red Wing presents the COURIER

A New High Speed Six
30–65 h.p.



For Fast Runabouts

Bore, 3⅜", Stroke, 4⅛". Cylinder displacement, 221 cu. in. Full pressure lubrication, with patented Red Wing submerged type oil pump and built in oil cooler. Crankshaft diameter, 2⅜ in. Length over all, only 49". Price, iron base type only $595. Aluminum base type (illustrated) $645. Both complete with electric starter.

HERE'S smooth-flowing power for swift runabout or light cruiser. The new COURIER is compact and light — yet into it are built the rugged strength and long life that have, for 30 years marked all Red Wing Thorobred Marine Motors.

The complete Thorobred line includes motors designed for every type of craft — from light fishing dory or small runabout to heavy work boat or luxurious cruiser.

There are 21 models — 4 to 150 h.p. Our engineers are always glad to offer recommendations based upon your particular requirements.

Write for the new 1932 Red Wing catalog

Red Wing Thorobred
THE MOTOR WITH POWER TO SPARE

RED WING MOTOR CO.

Red Wing, Minn., U. S. A.

other side of the boom and forward to a tackle. When you slack the tackle the clew comes inboard the length of the track and the lace line slacks up its whole length. This outfit works perfectly, is stronger than a full length boom track, and on occasion can expedite passing reef points.

There are many departures from the orthodox in the design of such details as the ratlines, the telescoping slide of the forehatch, the 5- x 6-inch guards on which the davits are stepped, the method of securing the skylights, which are drip proof. Of the handling of the exhaust I shall hope to write in a later article.

One more feature is worthy of description in detail. *Mahdee's* home mooring is in a tideway. To overcome the continued annoyance of the mooring gear chafing on the bobstay, the lower bobstay fitting was designed with a lower eye. This fitting is a massive bronze casting, faired to the hull and secured by three 1-inch bolts through 12 inches of oak knee. A short length of chain is shackled to the lower eye and secured at the other end by a lanyard to the end of the bowsprit. On approaching the mooring the outboard end of this chain is brought on deck. The end of the mooring chain is equipped with a heavy gaff topsail hook. This is hauled aboard, secured to the short chain, and tossed overboard, thus allowing the boat to ride to her moorings secured below the bobstay, chafe free. The pennant is long enough to lie slack and is used to hand the connection aboard when casting off.

Mahdee has proved herself a grand sea boat, although she has, so far, only had the opportunity to make little jaunts between Long Island Sound and the Maine coast. As a houseboat she is an unqualified success from mooring to back porch. As a power boat she handles with the ease of a steam towboat, but as a racer she would have to have weather that few competitors would be found to start in.

The Outlook for the Outboards

(*Continued from page 62*)

replaced must be purchased by the driver. Service men will not be permitted to give away or loan parts, as racing motors are not warranted because of the extreme hazards of racing.

"If any changes are made in order to increase the speed of racing motors, then the manufacturer will furnish the parts, or the drawings, or the labor necessary to change the driver's motors to agree with the changes adopted, provided the driver has purchased his equipment within three months preceding the change and provided such motors have been registered. This does not include changes in propellers, spark plugs, piston rings, gears, carburetors or other accessories. Nor does it include changes to be made in the manufacturer's yearly models between December 15th and March 15th. All transportation charges on equipment sent to the factories to be changed must be borne by the owner of the equipment."

\+ + +

Down in Texas they have dug out a one-mile race track to a depth of five feet or more and turned it into a splendid race course for outboard boats. A reader of an English boating magazine writes in to the editor to inquire why they don't bank the turns of this water course as they do automobile race tracks.

The 118-foot Sheila, *owned by Mr. George W. Loft of New York City, is a regular visitor at Captain Tuthill's Socony Marine Station at Greenport, L. I. The* Sheila *is powered with two 8-cylinder Winton Diesels.*

Year after year . . . .

boats like the Sheila *play safe with*

SOCONY

CAPTAIN "Dave" Tuthill's Socony Marine Station at Greenport, Long Island—one of the best-known marine stations in the East—is a regular port of call for hundreds of fine yachts and cruisers like Mr. George W. Loft's *Sheila.* Year after year the owners and captains of these boats fill their fuel tanks at this station with Socony Diesel Fuel Oil or Socony Gasoline, and lubricate their engines with Socony Turex Oil or De-waxed Motor Oil.

These boat owners realize they can't take chances with such important investments at stake. We suggest that you follow their example by lubricating your boat with Socony Turex Oil or Socony De-waxed Motor Oil, and fueling it with Socony Diesel Fuel Oil or Socony Gasoline.

SOCONY

BANNER GASOLINE
SPECIAL plus ETHYL
TUREX OIL
DE-WAXED MOTOR OIL

STANDARD OIL COMPANY OF NEW YORK, INC.

Mr. Boat Owner—

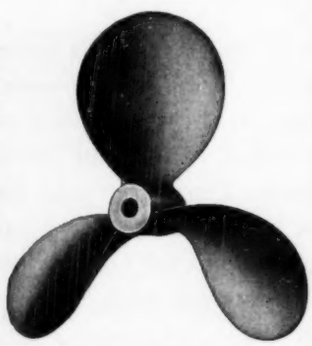
THE FOLLOWING ARE THE LIST PRICES OF HYDE TURBINE TYPE PROPELLERS TO WHICH

25% DISCOUNT APPLIES

PRICES F. O. B. FACTORY AT BATH, MAINE

Diameter	Two Blade	Three Blade	Extra Bored and Key Seated
8″	$ 4.50	$ 6.50	$ 1.40
9″	4.75	7.25	1.40
10″	5.00	8.00	1.40
11″	5.50	8.50	1.50
12″	6.50	9.50	1.70
13″	7.50	10.00	1.80
14″	8.50	11.00	1.90
15″	9.50	12.00	2.20
16″	11.00	14.00	2.20
17″	11.50	15.00	2.50
18″	12.00	16.00	2.50
19″	14.50	19.50	2.75
20″	17.00	23.00	2.75
21″	18.50	27.50	3.10
22″	20.00	32.00	3.10
23″	22.00	35.50	3.50
24″	24.00	39.00	3.50
25″	27.00	42.50	4.00
26″	30.00	46.00	4.00
27″	34.00	51.50	4.60
28″	38.00	57.00	4.60
30″	46.50	62.00	5.10
32″	52.00	70.00	5.80
33″	56.00	75.00	7.00
34″	59.00	79.00	7.00
35″	62.50	83.50	8.00
36″	65.00	87.00	8.00
38″	80.00	104.00	9.40
40″	100.00	134.00	10.70
42″		144.00	13.50
44″		168.00	14.75
46″		200.00	16.00
48″		235.00	20.00
50″		255.00	26.00

WHILE WE HAVE REDUCED OUR PRICES, WE HAVE NOT CHANGED OUR QUALITY. ONLY PURE VIRGIN METALS —NO SCRAP—ARE USED IN HYDE PRODUCTS. OUR GUARANTEE IS YOUR PROTECTION. INSIST ON A GUARANTEE AND YOU WILL INSIST ON A



HYDE

If there is no HYDE dealer in your locality, or if you are unable to obtain what you require, send your order direct to the factory. It will receive prompt and careful attention.

A copy of our booklet "Propeller Efficiency" will be mailed without charge. It illustrates all of the Hyde products.

HYDE WINDLASS CO.

A large stock of HYDE propellers and HYDE products is carried by C. R. Andrews, 143 Chambers St., New York City. Tel. BArclay 7-1873.

BATH MAINE

An "Intrepid" Cruise

(*Continued from page 57*)

to Old Point Comfort seemed fairly good time, considering that we had sailed 28 days of this with a single-reefed mainsail which also had to be lowered almost daily for repairs.

The following day the immigration and customs inspectors cleared us and at 6:00 A.M. of the 21st we started for New York. Sailing up the coast that night we discovered that our coast charts did not overlap and that there was a stretch of about 25 miles for which we had no chart. We sighted several flashing buoys which we knew must indicate shoals, but being entirely unfamiliar with this coast we gave them all a good wide berth. Everything was clear sailing again until the following night. In a squall our mainsail was torn so badly that we put in three reefs rather than repair it. Having so little sail we tried out our spinnaker, but in less than fifteen minutes it, too, had blown to pieces. The following day we must have presented a pretty sight sailing through all the traffic of the bay and up the Hudson with a patchwork mainsail, triple-reefed, and a spliced boom which had been wrapped with burlap to prevent chafing the sail. But what did we care? We had reached our destination, just six months and 21 days from Manila.

Waterspouts I Have Not Met

(*Continued from page 37*)

reported as being a mile high and 25 feet in diameter was seen in Escambia Bay, Pensacola, on the afternoon of July 21st, 1920. The broadest spout on record was seen off the coast of California November 21st, 1914. It was estimated to be 700 feet in diameter, though only about 100 feet high.

Waterspouts, like the so-called funnel clouds of tornadoes, assume a great variety of shapes. One seen off the coast of New South Wales in August, 1894, after swaying and twisting for some time, appeared to make a complete coil and then to burst, discharging a great quantity of water from the lower part of the coil. This coil was probably a mere effect of perspective. The spout was two miles from the ship at the time.

A very large spout seen from the British steamship *Aragaz* in September, 1914, had been watched for more than half an hour, when it appeared to bulge out several times within the trunk, each swelling sending out large masses of water, which whirled down around the spout below. "Finally," says the second officer, Mr. Hay, "it took a round turn and broke, the upper end curling upwards like a released steel spring. The motions were clearly observed through the binoculars."

Three waterspouts were seen to seaward from the harbor of Vera Cruz one morning in June, 1927. A few minutes before the first one disappeared it "palpitated in the middle between sea and sky as if breathing, throwing off at the same time what appeared to be like smoke." A spout seen from the British steamship *Wabana* in September, 1916, was about 3,500 feet high. It extended down about 500 feet vertically, then ran out some 2,000 feet almost horizontally, finally curving back to the vertical before reaching the sea. A double spout seen from the British steamship *Arracan* in March, 1921, consisted of two trunks hanging from the clouds and joining a little above sea level. Still lower the spout was invisible, but it was seen again at the point of junction with the sea.

Waterspouts most frequently advance in the direc-

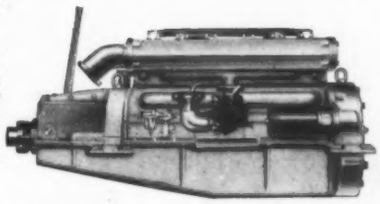
There's a proven GRAY for every Boat

Three Lines of Gray Motors for 1932 provide a motor for every boat.

The Gray "Phantom" Series, specially designed for Fast Runabouts, represents the last word in high-speed motors. No other line of Runabout Motors offers you as much power per pound of weight or per inch of length. Six new but proven motors.

The Gray "High-Torque" Series provide motors for Hard Work in heavier boats turning large wheels. Five New Motors, compact, easily installed, and with all parts quickly accessible.

The Gray "Utility" Series comprises Fours, Sixes and the Gray EIGHT which have proven the world's most popular motors in years past. Improved, refined, reasonably priced.



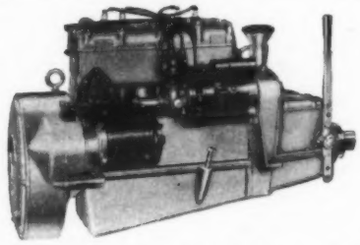
"High Torque" "480", typical of Gray "High Torque" Series. Five Hard Work Motors, built for continuous slow-speed work and long life. Heavy balanced crankshafts. Full pressure lubrication. Oversize ball-bearing clutch. Individual mounting of all accessories. Hold-down bolts in clear. In spite of finest engineering and workmanship, note low prices below.

GRAY MARINE MOTOR CO.
656 Canton Ave., Detroit, Michigan

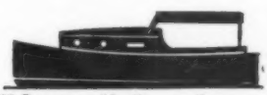
Gray Marine Motor Co. of Canada, Ltd.
120 Sandwich St., Windsor, Ont.

MODEL	Price	Bore	Stroke	Displacement cu. in.	Maximum H. P.	Length Overall	Weight Lbs.	Opposite Rotation Available	Reduction Gr. Ratio Available	Double Ignition Available
"Phantom" Series (A) Eight**	$1100	3 3/8"	4 1/2"	322	150	59 11/16"	1015	Yes	9:5, 5:2	No
(B) "93"	650	3 3/8"	4"	214	93	43 1/16"	665	No	No	No
(C) "66"	550	3 1/16"	3 7/8"	200	71	44"	620	No	No	No
(D) "Blue Streak" **	500	3 1/4"	4"	132	59	30 1/16"	350	No	No	No
(E) "49"	400	3 1/4"	4"	132	49	30 1/16"	368	No	2:1	No
(F) "32" *	350	2 3/4"	3 5/32"	75	32	32"	297	No	No	No
"High-Torque" Series‡ (G) Four 35 *	388	3 3/8"	4 1/4"	152	40	36 3/4"	508	No	2:1	No
(H) Four 56	498	4 1/8"	4 1/4"	227	59	46 1/4"	740	Yes	9:5, 5:2	Yes
(I) "380" §	1000	4 1/4"	4 1/2"	383	85	56 5/16"	1270	Yes	No	Yes
(J) "480" §	1300	4 5/8"	4 3/4"	479	105	60 3/8"	1400	Yes	No	Yes
(K) "530"	1400	4 5/8"	5 1/4"	529	120	60 3/8"	1400	Yes	No	Yes
Utility Series‡ (L) Light Four †	325	2 3/4"	3 5/32"	75	24	32"	344	No	2:1	No
(M) Four 20	366	3 1/4"	4"	132	30	31 3/4"	400	No	2:1	No
(N) Four 44 †	444	3 7/8"	4 1/4"	200	44	46 1/4"	725	Yes	2:1, 5:2, 9:5	Yes
(O) Six 56	495	3 1/16"	3 7/8"	200	51	46 1/16"	705	No	2:1	Yes
(P) Six 70	595	3 3/8"	4"	214	58	49 3/8"	805	Yes	9:5, 5:2	No
(Q) Six 72	695	3 3/8"	4 5/8"	249	65	50 3/4"	895	No	9:5, 5:2	No
(R) Cruiser Eight †	975	3 3/8"	4 1/2"	322	125	59 11/16"	1150	Yes	9:5, 5:2	No

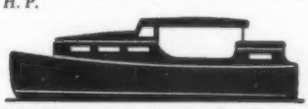
* Available without clutch and reverse gear.
** Downdraft carburetor.
§ Double ignition standard equipment.
† Special economical carburetor and restricted manifolding available for extreme economy at low engine speeds.
‡ Iron base and housings standard equipment.



"High-Torque" Four-35, 3 3/8" bore, 4 1/4" stroke, 152 cu. in. displacement. Develops 40 h.p. Length 36 3/4". Available with 2:1 Reduction Gear.



24-28 Round or Vee-Bottom Cruisers and Heavy Skiffs or Workboats.—*Four-35, 22-40 H. P.; Four-44, 23-44 H. P.; Four-56, 42-59 H. P.; Six-56, 35-51 H. P.; Cruiser Eight, 68-125 H. P.*



30-36 Round or Vee-Bottom Cruisers and Workboats.—*Six-56, 35-51 H. P.; Six-70, 38-58 H. P.; Six-72, 39-65 H. P.; Cruiser Eight, 68-125 H. P.*

12'-14' Skiffs and Utility Runabouts.—*"Light Four", 10-24 H. P.; "Four-20", 12-30 H. P.; Phantom "49", 22-40 H. P.*

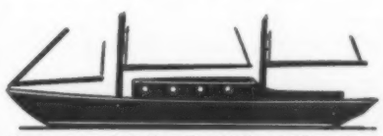
13'-15' Vee-design Runabouts.—*Phantom "32", 25-32 H. P.; Phantom "49", 45-49 H. P.; Blue Streak, 50-59 H. P.*

15'-17' Vee-design Runabouts.—*Phantom "49", 45-49 H. P.; Blue Streak, 50-59 H. P.; Phantom "66", 63-71 H. P.*

17'-21' Vee-design Runabouts and Skiffs.—*Phantom "66", 63-71 H. P.; Phantom "93", 80-93 H. P.*

22'-28' Vee-design or Roundbottom Taxi Hulls.—*Phantom "93", 80-93 H. P.; Phantom Eight, 125-150 H. P.*

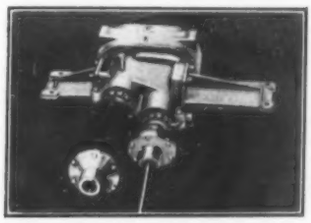
Motor Craft with Motor Aft. All styles from 15' to 30' long.—*The Gray "Vee-Drive" Gear, in types and sizes to carry any engine developing up to 200 H. P. at 3,000 r. p. m. New Low Prices for 1932.*



Auxiliaries.—*Light Four, Four-20, Four-35, Four-44 and Four-56. With or without Reduction Gear and Gray "Vee-Drive" Gear.*

Heavy Cruisers, Ferries and Workboats up to 70'.—*Model "380", single or twin, 63-85 H. P.; Model "480", single or twin, 80-105 H. P.; Model "530", single or twin, 90-120 H. P.; Twin Eights, or single or twin Fours or Sixes with reduction gears.*

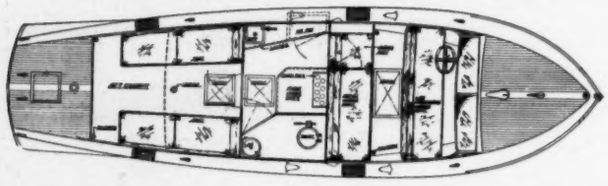
20-23 Inboard Cruisers.—*Light Four, 10-24 H. P.; Four-20, 18-30 H. P.*



The Gray "Vee-Drive" Gear for Motor Craft with Motor Aft.—*Pioneered and produced by Gray three years ago. Provides more usable boat space, more speed, better boat handling and installs in any boat. Quiet. In thousands of boats. Not a single unit has broken up or failed to operate in service. Complete details and prices upon request.*

CUSTOM DESIGNS by Robinson Craftsmen at Commanding Values

THE buying trend in the boating field today definitely points to the custom built boat. This is particularly true when no penalty of higher price is added for such rare owner distinction. The Robinson organization of boat builders have long pioneered in this class of construction—now offer you the threefold advantages of their skilled personnel—their renowned experience—and their exceptional facilities. At today's prices you can commission us to build a boat—cruiser, commuter, sport boat, runabout, sail or power yacht up to 90 feet in length—that fulfills every individual need for comfort, speed, cruising range and guaranteed dependability at no greater price than you now pay for a boat of stock design. For proof of this—write for the new folder on Robinson custom designs. See what we can offer you in a smart, sophisticated runabout, cruiser, fishing boat, commuter, tender or sail yacht.



The New York Motor Boat Show will have on display the new Seagull Custom Sport Boat, a 32-foot design available in a variety of arrangements to match individual uses and needs. Speeds of 30—40 m. p. h. are available in this special design (No. 3201). Prices range from $4950 and up.

ROBINSON Seagull CRUISERS

ROBINSON MARINE CONSTRUCTION CO.
Benton Harbor . . . . . Michigan

tion of the surface wind, but often in other directions. Some move slowly, or even seem to remain stationary for a time, while others travel at terrific speed. Three seen at one time from a ship in the North Pacific in May, 1917, were estimated to be advancing over the water at 80 miles an hour.

Though many seafaring men profess to have no fear of waterspouts, these whirling columns have frequently damaged vessels and in some cases they have occasioned loss of life. Colonel Reid, in his "Law of Storms," tells of a Spanish brig that was capsized by a waterspout a century or so ago. The vessel was under full sail, with a very light breeze and fine weather, when she suddenly ran foul of the spout and was instantly upset. The captain and crew took to a boat and were subsequently picked up by another vessel.

On April 10th, 1885, the German bark *Ceylon* had her mainmast and mizzenmast carried away by a waterspout. Her first mate was killed and her captain injured. On January 14th, 1887, the British bark *Autocrat* was thrown on her beam ends and sustained much damage. On February 9th, 1887, the bark *Winonah* had all her yards broken. On February 11th, 1888, the bark *Reindeer*, west of Bermuda, was completely dismasted by a waterspout.

On the afternoon of April 4th, 1902, while off Cape Hatteras, Captain Ferguson, of the British steamship *Hestia*, observed several spouts in process of formation at a distance of 300 to 400 yards to windward. The largest of these, and the only one completely formed, seemed to be headed directly toward the ship. At first the captain attempted to avoid a collision by changing his course, but he found that this was impossible. Ordering everybody below, he remained on deck until the spout was close on the ship and then rushed for shelter. A deafening roar was quickly followed by strong gusts of wind and a sudden shock, as the spout struck amidships and passed over the vessel. Captain Ferguson regained the deck in time to see two tarpaulins, which had covered the hatches, and a plank eight feet long by ten inches wide high up in the air, while the log line with the patent log attached extended straight up in the air to a distance of 40 feet. Beyond the loss of light moveable objects on deck, no harm was done.

On the other hand, there are reports of small boats passing unscathed through waterspouts, so it is evident that these aerial whirls vary widely in speed of rotation, and there are theoretical reasons for assuming that this should be the case. The highest possible speed is a matter of pure speculation. It probably amounts to several hundred miles an hour.

Waterspouts are not peculiar to salt water. In this country they are reported almost every year from the Great Lakes, and they are occasionally seen on smaller lakes and rivers. Every tornado that crosses a body of water becomes a waterspout for the time being, and waterspouts that move inland from the water sometimes persist for a time as tornadoes. Waterspouts and tornadoes have much in common, and the statement has crystallized in scientific literature that the two phenomena are identical, but this statement requires a good deal of qualification. Thus, true tornadoes are very rare in the tropics, where waterspouts are most common; a tornado is always extremely violent, while many waterspouts are not; the average horizontal area of a tornado is much greater than that of a waterspout; and while a waterspout hardly ever exists as long as an hour, and generally only a few minutes, a tornado sometimes lasts for several hours.

The hoary myth that a waterspout can be dispelled by shooting at it bobs up serenely in Miss Joan Lowell's "Cradle of the Deep," where the heroine's father dramatically saves the ship by this time-honored device.

The Invader's Record-Breaking Year . . .

The Hall-Scott INVADER closes its first year with an unequalled record of sales and achievements. East Coast, West Coast, Great Lakes—wherever fine boats are built—Hall-Scott Invaders are in demand. Here is the list of nationally known builders who used INVADERS during 1931:

American Car and Foundry Company of New York, N. Y.
Corsair Boat Company of Trenton, Michigan.
Dawn Boat Corporation of New York, N. Y.
Dee White, Inc., of Detroit, Michigan.
Fyfe's Ship Yard of Glenwood Landing, Long Island, N. Y.
Gibbs Gas Engine Co. of Jacksonville, Florida.
William H. Hand, Jr., of New Bedford, Mass.
Hutchison Boat Works of Alexandria Bay, N. Y.
Jesiek Brothers Shipyard of Holland, Michigan.
Hubert S. Johnson Boat and Engine Works of Bay Head, N. J.
The Lyon-Tuttle Corporation of New York, N. Y.
John Martin of Atlantic City, N. J.
Clive Merchant of Lantana, Florida.
Matthews Company of Port Clinton, Ohio.
Purdy Boat Works of Port Washington, N. Y.
Red Bank Yacht Works of Red Bank, N. J.
Robinson Marine Construction Co. of Benton Harbor, Michigan.
Stephens Brothers of Stockton, California.
Wheeler Shipyard of Brooklyn, N. Y.

Evidence this of Hall-Scott's preference. If further assurance of Hall-Scott's dependability, economy, ease of installation, and operation is wanted, we confidently refer you to any one of the builders mentioned here.

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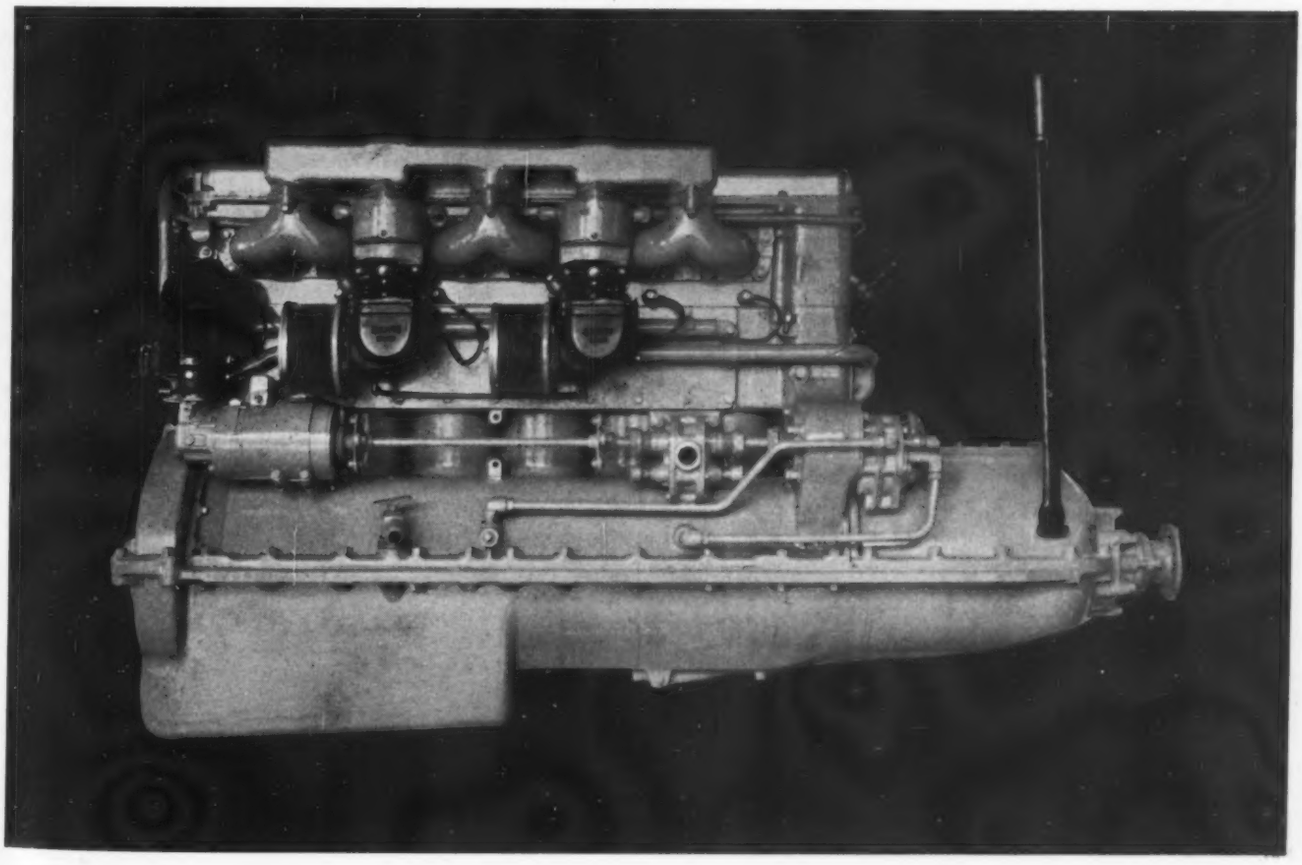

The Importance of having a liberal supply of bottled Natural Mineral Water on board at all times is apparent.

POLAND WATER is always the same — pure and healthful.

Available from leading supply houses in cases of 24 half gallons, 50 bottles (near the quart size), 50 half bottles (near the pint size), and cartons of 6 half gallons, 12 bottles and 12 half bottles to suit the convenience of yachtsmen.

The World's Foremost Natural Mineral Water

Whether your visit to the Motor City is for Business or Pleasure or Both.....

You'll find greater comfort, convenience and economy at HOTEL DETROIT-LELAND

800 OUTSIDE ROOMS
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Main Dining Room & Coffee Shop with electrically cooled and purified air

NOW BAKER OPERATED
affording that cordial hospitality for which Baker Hotels are famous

DETROIT

The skipper orders everybody below to escape the deluge of the breaking column, seizes his rifle and opens fire. Whereupon:

"Like a wounded beast the spout seemed to stagger and then collapse, dropping tons of water, fish and driftwood back into the sea. The spout when it collapsed was nearly half a mile away."

Although it bespeaks a rather uncommon amount of optimism on the part of the mariner to expect results from a mere rifle at a range of half a mile — the more usual defensive weapon in these encounters being a cannon — many a sailor besides Captain Lowell has fired at a waterspout and has reported in all sincerity, as that worthy does in his daughter's narrative, that "the shot busted it."

What really happens in these cases? Evidently, the momentary vibration of the air resulting from a distant explosion cannot put an end to an enormously powerful whirlwind. A broadside from a battleship at a range of a few rods might cause a waterspout to sway slightly. It certainly would not break it up.

Waterspouts, as we have already stated, are always short-lived creatures. Hence one is sure to break up from natural causes within a few minutes after a shot is fired at it, and it would not be a remarkable coincidence if the collapse and the firing were almost simultaneous. Such coincidences have doubtless occurred frequently enough to perpetuate the faith of seamen in the efficacy of the process, which is, however, more often resorted to nowadays in story books than in real life.

The origin of the custom is purely superstitious. Centuries ago mariners fired guns at waterspouts, not for the purpose of shaking them to pieces but in the hope of frightening them away. Before the invention of firearms the sailor employed any noise-making device available for keeping at a safe distance what he believed to be a living monster of the deep. The waterspout is commonly described by medieval writers as a "dragon."

As recently as the seventeenth century Samuel Purchas wrote: "Often they see come afar off great whirlwinds, which the mariners call dragons; if this passeth over their ship, it breaketh them and overwhelmeth them in the waves. When the mariners see them come, they take new swords and beat one against the other in a cross upon the prow, or toward the coast from whence the storm comes, and hold that this hinders it from coming over their ship and turneth it aside."

Writing at the close of the same century, the English navigator William Dampier describes the custom of firing at waterspouts, but in a skeptical tone characteristic of this level-headed seaman, who recognized the generic identity of West India hurricanes and China Sea typhoons, and in various other ways anticipated the ideas of modern meteorology. He says:

"Men at sea, when they see a spout coming and know not how to avoid it, do sometimes fire shot out of their great guns into it, to give it air or vent, that so it may break. But I did never hear that it proved to be of any benefit."

Of Interest to the Skipper

(*Continued from page 88*)

fire extinguisher embodying many improvements over earlier models. This new model has been designed so that the operating valve is at the back instead of the front when the extinguisher hangs on a wall. This feature was designed purposely to remove the operating valve from accidental opening and to discourage tampering.

The liquid gage and air pressure gage are located directly in front where they may be clearly seen at inspection. A hanger and hook have been provided so that the extinguisher can be hung on a wall or post, where it is readily accessible in cases of emergency. Another new feature is the simple and positive method of locking the air storage pump piston handle to the extinguisher, permitting the extinguisher to be carried conveniently by the handle.

A feature is the operating valve which functions fully at a half-turn of the hand wheel. The air chamber is of generous proportion to insure an excess of air pressure for discharging one gallon of Pyrene Fire Extinguishing Liquid in a rapid and forceful manner under initial pressure of 100 pounds. The time of complete discharge is 55 seconds, with an effective range of stream of 30 to 40 feet. Another special feature is the provision made for a carrying strap which can be slung over the shoulder, permitting the operator to move about freely, and giving full use of both hands to operate the valve and direct the stream.

The extinguisher can be easily recharged simply by pouring in Pyrene Fire Extinguishing Liquid until the glass shows it to be full. Air may be charged by use of the hand pump or with an air service line to 100 pounds pressure. Pyrene Fire Extinguishing Liquid will not deteriorate with age and is good until used.

The extinguisher is adapted for use in any climate and may be placed outdoors since it will not freeze at temperatures as low as 48° F below zero. It is inspected and labeled by the Underwriters' Laboratories and bears the approval mark of the Associated Factory Mutual.

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J. Thornton Mills Associated with John H. Wells

John H. Wells, Inc., naval architects and yacht brokers, announce that J. Thornton Mills is now associated with them, in charge of their sail boat brokerage division.

Mr. Mills is well known in yachting circles and the marine industry, and is a member of the Larchmont Yacht Club. His experience in ocean cruising and racing, as well as extensive coastwise sailing should prove of value to clients of the Wells organization.

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Century Outboards Victorious

Major victories in two regattas in widely separated sections of the country went to Century outboard race boats early in December, starting them off in auspicious style for the 1932 campaigns.

Blue Streak VII, a Century Cyclone, easily won two of the most valuable trophies offered for outboard competition on the Pacific Coast, the Shadowpoint and Com. MacKay trophies, at Lake Elsinore, Cal., December 6th.

A week later, at Winter Haven, Florida, Jack Wood, of Detroit, driving a Century Midget and a Century Cyclone, had no trouble in winning the Classes B, C and Free-for-all events, while Malcolm Pope, driving a Century Hurricane, easily won the Class D race. Century boats made a clean sweep in Class D.

Faces that laugh at weather

are shaved with

Barbasol

So this Spring—SHAVE WITHOUT LATHER!

Use Barbasol—it protects the face, prevents dry, harsh, weather-roughened skin, chapping and wind-burn

WHETHER zipping down the Cresta Run at eighty on a bobsled, or piloting a brief-case over wind-swept city streets, your face needs this protection from winds that slash like knives.

So this season—SHAVE WITHOUT LATHER! Use Barbasol, which growing millions have made the world's fastest-selling shaving cream.

Because it *is* a cream, and free from harsh, biting alkalis, it leaves the skin soft, smooth and pliable. The natural oil stays in the skin. And the wonderful ingredients of Barbasol add their own marvelous protection. You can face the weather, for business or sport, without fear of harsh, chapped, roughened skin.

This new, quick, modern shaving cream softens the beard like magic, yet holds the hairs straight up for a clean, close cut. And your razor gliding through on a thin film of cream whisks them off in a flash—no brush—no lather—no rub-in!

Now use Barbasol right. Follow these directions and you'll follow the crowd:

1 Wet your face and leave it wet. **2** Spread on Barbasol. (Don't rub it in.) **3** Wet a good blade—and SHAVE.

That's all there is to the finest shave in the world. It's simple, easy, quick. Try it today. Generous tubes at all druggists', 35¢ and 65¢, will quickly make you a Barbasol Believer.

Banish Toothbrush Costs Forever

In every 30¢ tube of Tefra Toothpaste there is a Tefra *refill* for a lifetime Tefra refillable toothbrush handle. You'll want to know more about the Tefra refillable handle, so tune in on radio broadcasts noted below. Or send an empty Barbasol carton, with your name and address, and we will mail you a Tefra Toothbrush complete, 75¢ value, with your name or initials engraved on the handle, absolutely FREE. The Barbasol Company, Dept. Y-2, Indianapolis, Indiana

BARBASOL RADIO BROADCASTS

Singin' Sam, the Barbasol Man, in songs you can't forget. Every Monday, Wednesday and Friday evening, at 8:15, Eastern Standard Time, over an extensive Columbia Broadcasting hook-up.

●

The Old Singin' Master and his singers—mellow old hymns and ballads the way you like them. Tune in every Sunday night at 10:15, Eastern Standard Time, on the N.B.C. Blue network (WJZ), coast to coast.

Consult radio page of your local newspaper for stations